The Practical Teacher

A MONTHLY EDUCATIONAL JOURNAL.

Edited by JOSEPH HUGHES.

'*Knowledge is proud that he has learned so much,*
Wisdom is humble that he knows no more.'—COWPER.

VOL. XIII. No. 1. JULY, 1892. { PRICE, 6D. / POST FREE, 8D.

ELEMENTARY LESSONS IN AGRICULTURE.

BY PROF. GREEN,

Examiner in Botany to the University of Cambridge.

XII.

ROTATION OF CROPS.

WE have now discussed the relation of the plant to the soil, and the demands which are made upon the resources of the latter by the several crops which a farmer usually cultivates. When we consider how he can most advantageously utilise the various materials which his land contains, it strikes us at once that this will probably be done by having crops to follow each other, which either demand different constituents for their coming to perfection, or which, at any rate, draw upon the storehouse of the same materials in very different degrees.

Let us first remind ourselves of what the soil contains. There is a considerable proportion of humus, or decaying organic matter, and this is mixed with inorganic particles of abraded rock or mineral matter. The constituents of this vary very much. We have some containing nitrogen, some without this element. We have a varying mixture of sand and clay, mixed with compounds of soda, potash, lime, magnesium and other elements, and we have, too, in the same compounds, phosphoric, sulphuric, and other acids. Some of this mass of inorganic matter is readily soluble; the rest quite insoluble in the water which permeates the soil. Thus we find active and dormant food material of very great variety. We find, further, that the proportions of these to one another, and the proportion of the several ingredients in each, will be very different in the soil at the surface and the layer which lies under this and is called the subsoil.

Into this complex mixture of inorganic and organic matter various plants can be induced easily to grow. Some of them make but little root and do not penetrate many inches below the surface; others have very long and much-branched roots, and penetrate well into the subsoil. We saw also, in the last article, what very different properties these various crops have, and how some require large quantities of some of the salts presented to them thus, while others leave these almost alone and absorb quantities of different ones.

We must remember, too, that the soil is the seat of very active chemical change, the dormant or insoluble food materials thereby becoming converted into active ones, or those immediately of service to the crop. This process of chemical change and decomposition proceeds but slowly when the land is left to the action of natural forces alone, and can be materially hastened by the operations of tillage.

So the soil can be regarded as a very complex mixture of organic and inorganic matter, containing various stores of plant food, unequally distributed and varying very much in composition, part available for immediate use and part capable of being slowly converted into similar valuable matter.

The problem that meets the agriculturist is then to utilise this reserve material to the best advantage, to turn the inorganic material into the substance of his crop, and to facilitate the decompositions which lead to the transformation of the insoluble or dormant ingredients.

This problem involves in its solution the question of the supply of manure or the supplementing of the food existing in any piece of soil by other material in which that soil is deficient, in order, that by adequate growth and development the plant may take up the ingredients already there, which it would be unable to do efficiently in the absence of the manure so applied. For we must remember we do not in manuring always attempt to supply everything the crop requires, but chiefly, if not solely, those constituents which the soil is lacking, without which the supply of those already there will be unavailing to procure proper development. The supplementary matter so supplied will, as we saw last month, very much depend on the particular crop to be cultivated.

Only a little reflection is needed to show that under these conditions at starting it will be likely to prove bad policy to grow the same crop year after year on the same field. Even if we restore year after year the materials which that crop has taken away, we are neglecting the material in the soil which that crop makes little or no demands upon. The great bulk of

BRITISH MUSEUM

this remains practically useless, and we leave untouched a store which by proper treatment can be rendered valuable.

When, again, we consider that in supplementing the store of available food material by artificial fertilisers we are incurring considerable outlay of money, and that agriculture must be carried out so as to be commercially as well as scientifically successful, we can realise the importance of so managing operations that the store of dormant food materials may be continuously, if gradually, drawn upon. The soil, indeed, may contain in an intractable form the very material which the plant is requiring, and which is being supplied to it in the shape of a manure.

Though the land will gradually show this transformation of its constituents from the dormant to the active condition, even when crops are being grown upon it, a season of rest materially facilitates the change. When kept under continuous cropping for many years it gradually becomes less and less fertile, and the successive crops show deterioration. A period of rest, if only for one season, during which the land shall be broken up, exposed freely to changes of temperature, to the action of the air and rain, and to decomposition of the organic matter left in it in the shape of roots, etc., will largely restore fertility, even without the addition of any inorganic substances. Periods of activity, then, must be alternated with periods of rest to ensure the best results. This is indeed the beginning of the system of rotation of crops.

But the problem is not satisfied by this simple rotation of periods of rest with others of activity. The crops which are to be cultivated may indeed be the same year after year during these last periods, but this is at once expensive and wasteful, as we have seen above. To use the active materials in a soil we should cultivate crops which will take up in turn the various ingredients present, so that none may be passed by. We must also see that some of them are such as will feed upon the materials of the surface, while others also put the subsoil under contribution.

Just as the period of activity is thus capable of very varied treatment, so also is that of rest. The impoverishment of the soil characteristic of the former period is due to the fact that the crops grown then are removed from the land and not returned to it in any shape. If, on the other hand, a crop be grown upon a field and not taken away, but allowed to remain in some form, the impoverishment of the first time does not follow.

Thus, if a green crop be ploughed in and the material of which it is composed be allowed to decompose in the soil, and so increase the humus, we have the green manuring of which we have already treated, and which, so far from exhausting the soil, actually enriches it. Again, if root crops be cultivated and fed off by sheep, the soil is enriched by the application of the manure from the animals. Even if the roots or fodder be removed and consumed in the stock-yard, and the manure so made be replaced in the land, there is no impoverishment. It is possible, then, for the period of rest to be employed in raising a crop to be thus disposed of.

When a field is allowed to rest from bearing a crop which will be removed it is said to be a *fallow*, and we find in practice that there are fallows of two kinds—the one where no crop is grown at all, or a *bare fallow*, and the other where a crop is cultivated, the constituents of which are in some way returned to the land; this being known as a *cropped fallow*. Each of these has its advantages.

In determining which of them is most suitable for a particular field several conditions have to be considered. The first of these is the character of the soil. Stiff clay soils are not well adapted to the growth of root crops, which, as we have seen, are cultivated with the view of improving the land. It is difficult and expensive to get such land into the proper condition to grow turnips in the spring or early summer, and it is harmful to such land to cart off the produce or to consume it in the field during winter. The soil is too plastic, and these operations make it too close in texture. Forage crops may indeed be grown on such land, because they can be consumed in autumn before the wet of winter interferes. Bare fallows are necessary sometimes when the land has become foul from the growth of weeds.

Light or free soils are suitable for the growth of both root and forage crops, because the treading and manuring of the sheep during the winter assist in consolidating the soil, which in this case is necessary for the growth of a corn crop.

Another consideration will be the relative characters of the soil and the subsoil. When it is necessary to put the latter under contribution, a fallow should be cropped with a plant which is deep-rooted, so that the material of the subsoil may be taken up by the vegetation.

When this is ploughed in, or the manure resulting from it is allowed to be deposited upon the surface, the top soil is enriched with the materials so brought from some distance down. Leguminous crops are very commonly cultivated on fallows, and we have in them a means of increasing the nitrogenous constituents of the soil, for we have seen that in some imperfectly understood way these plants are enabled to fix the nitrogen of the atmosphere, yielding nitrogenous matter to the soil to a very remarkable degree.

Thus, by a proper arrangement of the fallow, we can not only avoid robbing the soil of food material, but we can actually increase the store, by bringing it up from the subsoil or by adding to the nitrogenous compounds in it from the atmosphere above it.

The rotation of the crops comes thus to consist of an alternation of those which are altogether removed, or *exhausting* crops, and those which are consumed upon the land, or used to provide manure for it, the so-called *restorative* crops. Of the former, we have chiefly the cereals—wheat, barley, oats, and rye; of the latter, we have the various root crops—turnips, or mangold-wurzels, and the leguminous crops, or those grown for forage. The corn crops, besides removing the constituents of the soil, are a heavy tax upon it, on account of the conditions of their cultivation. They occupy the land for a considerable time—wheat, for instance, is sown in autumn and remains till the succeeding harvest. The plants are grown very thickly together, and for at any rate the last three months of their standing the growth is too high for any operations to be undertaken to remove weeds. There is often quite a luxuriant growth of these latter to be seen with such corn crop. The result is, the land, besides being exhausted by the crop, is drawn upon by the weeds, and it thus often becomes very foul, necessitating a bare fallow to succeed the corn crop.

The root crops show a marked difference from the cereals. Instead of occupying the land for nearly a whole year they are not sown till the late spring or early summer, leaving the land free for tillage operations thus for several months. They are not planted close together, a good space being needed for the development of the large root. Consequently, the troublesome weeds can be kept under during their growth. Neither are the weeds removed with the crop even if the latter be taken from the field, but are left and ploughed in in the ordinary course of tillage. The crop is either fed off on the soil, and so manure at once applied to it, or it is taken up and consumed on the farm elsewhere, yielding a valuable contribution to the manure-heap. It must not be thought, however, that because roots are included in the restorative crops that they only take a very little from the soil. On the contrary, they take up a great deal, and if they are removed from the farm and sold they are a most exhausting crop. The reason they are not so classed is, that in general practice they are so consumed on the farm as to return to it all they have taken out of it. They, as it were, borrow largely from the soil, but they repay all they have borrowed.

The inclusion of the forage or fodder crops among the restorative section we have already discussed. They are uniformly returned, in some form, to the soil, after serving in most cases as keep for cattle.

In a proper system of rotation these two kinds of crops, the exhausting and the restorative, must be duly adjusted with regard to each other; while from time to time a period of absolute rest must be allowed. The exact nature of the crops to be alternated with each other will very much depend upon the character of the soil.

In selecting crops to follow others, we have some general principles to guide us. Certain plants are especially suitable to precede others, preparing the way for them, as it were. Peas, or clover, will be found to be a good preparation for wheat, and the better the clover crop the better will be the wheat crop after it. The growth of the leguminous plant enriches the top soil by bringing up food from the subsoil through its large and deep-root system, and by fixation of nitrogen from the air. Hence the soil needs a less application of nitrogenous manure than if the leguminous crop had not preceded it.

On the other hand, certain crops cannot do well in succession to other ones, which are more nearly related to them than the two we have mentioned are to each other. Thus, rye-grass, which is often grown as a cropped fallow, is a very bad antecedent for wheat, which is another grass. Both draw upon the same store of nutrient materials, and the second crop finds the soil already impoverished. Occasionally, two cereal crops may be grown in succession, but this can only be done with advantage when the land is in very fine condition. Such a treatment further involves very careful manuring for the second crop. The experiments carried out by Lawes and Gilbert at Rothampstead have shown that for a long series of years the same cereal crop may be grown upon the same field, but its success will be largely a question of manuring, and in the hands of the ordinary farmer the plan would be a failure. In the case of clover, this course cannot be followed. After a comparatively short term of years clover fails to grow in succession to a clover crop, even if the land be carefully manured. The cost of the requisite manures for such a continuous cultivation becomes a very serious consideration for the average farmer, and it is soon found to be more economical to vary the crop according to the principles we have discussed.

There are various schemes in use by which these principles are carried out, some rotations extending over as few as four years, others taking five or six. These are generally practised in particular parts of England. One of those most in vogue is the so-called 'Norfolk' rotation, which is advantageously followed on light or free-working soils. It extends over four years only, and the order of the crops is roots, barley, seeds, wheat. The roots are usually fed off by sheep on the land. The seeds usually consist of clover or other similar fodder plant. It is simply an alternation of exhausting and restorative crops, the latter preparing the field for the subsequent crop of corn It is a very short rotation, and in many districts it is modified in several particulars. The root crop of the first year, which is not sown till late spring, is often preceded by an autumn crop of tares, which are fed off in spring in time for the sowing. This modification cannot be applied to stiff or clay soils on account of the damage done to the heavy land by the treading of the animals as the tares are consumed. The land, too, must be in very good condition as to freedom from weeds to allow of its being advantageous. This modification is found to answer well in the Midland and Southern counties of England, but further north the climate makes it difficult to apply.

Another modification of it is to substitute wheat or oats for the barley crop, yielding two wheat crops during the cycle. In the west and north of England frequently the clover or seed crop is allowed to stand for two or three years.

The so-called 'Northumberland' rotation is followed in the north of England. This differs from the Norfolk plan in making wheat follow roots; seeds or clover being then continued for two years, and oats following them instead of wheat.

Further north still, in the Lowlands of Scotland, the 'East Lothian' rotation is adopted. This consists of roots, barley, clover, oats, potatoes, wheat, making a six years cycle.

It is evident that in selecting a rotation no hard-and-fast rule can be of general application, as so much must depend on the character of the soil, which necessarily varies within small ranges of country. On the stiffest land, where clay is predominant, wheat and beans will be the most suitable exhausting crops, and the fallow will often have to be a bare one. On land with more loam, the fallow will be capable of bearing more frequently crops of mangold-wurzel or swede turnips. Potatoes make their appearance on loamy soils, and as we gradually pass to lighter loams and soils, in which sand is prominent, the bare fallow disappears and forage crops take its place. The wheat crop, with its deep roots, gives way to the more superficially rooted barley. Where lime is in good quantity leguminous crops play a greater part in the rotation.

To recapitulate, we have seen:—

1. The soil in which crops grow contains very variable amounts of the different food materials, some in active, some in dormant condition.

2. Various crops require varying amounts of these

materials, and according to the character of their root-systems take them from different layers of the soil.

3. Various operations lead to the transformation of the dormant to the active condition, and different crops with their different modes of cultivation can assist these transformations.

4. To utilise the stores of materials to the best advantage crops should be grown in turn, so as to draw approximately equally upon the various constituents of the soil.

5. Seasons of absolute or comparative rest are needed by the land to allow of the continuance of the cultivation of such crops as are removed from and so tend to exhaust the soil.

6. In practice it is advisable, in planning the succession of crops, to alternate an exhausting crop with one which helps to restore the fertility of the land, so that the one prepares the way for the other.

7. Based upon this principle, we have various systems of rotation of crops, which are found in practice to be most suitable to different parts of the country.

8. These rotations need to be modified in any case, according to the condition and character of any particular field.

(*To be continued.*)

TEACHERS' DRAWING LESSONS.

MODEL DRAWING FOR STANDARD V.

BY E. BUFFERY RIDGE,
Art Master under the London School Board

LESSON III.

RULE a blackboard, as shown in Fig. 5, with strong white lines, and fix it to the wall under the map used in previous lesson at such a height that one of the horizontal lines (preferably *c g*) is on a level with the

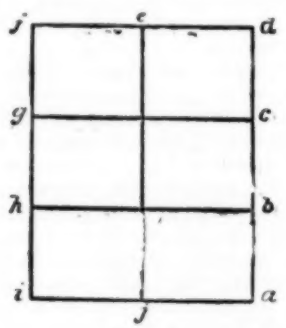


Fig. 5.

eyes of the majority of the class. Resting the bottom of the board on the seat of a chair as nearly upright as possible will generally answer very well.

Something to do—learnt last lesson:—To measure the inclination of lines by comparing them with the horizontal edge of the paper.

Something to know—refer to written notes.—What do they teach about drawing the blackboard?

No. 1. That it will be drawn narrower in proportion to its height than it really is.

No. 2. That *f i* will be shorter than *e j*, and *e j* shorter than *a d*.

Nos. 3 and 4. That the top of the board will *slant down* because it is *looked up to*, but not as much as the top and bottom of the map did.

Then what about the bottom of the map? It may be inferred that if the lines *looked up to* slant *down*, the bottom of the board, being *looked down to*, should slant *up*.

Try it with the paper-edge—it will be found that this is really the case; try the line *b h*—that also slants up; try *e g*—that slants neither up nor down; it is horizontal.

Show by measuring from the floor to *e g* with any stick long enough (map-pole for instance) that it is just as high as the eyes of the class, or of those among the scholars who see the line as a level line.

Learn:—Horizontal lines on a level with the eye always appear level.

Draw on blackboard (not that in use as a model) and papers the level line *g c*, all across, and nearer the top than the bottom, because more of the object to be drawn is below the eye than above it.

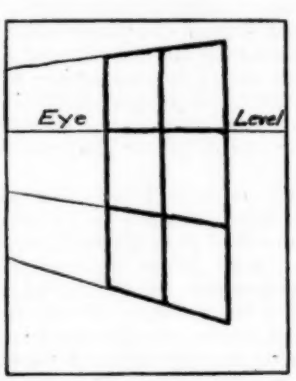


Fig. 6.

Write on the line 'eye-level,' and refer to it by that name. Draw at right angles the nearest upright line, which is *a d*, and mark it with one part above and two below the eye-level. Use paper-edge to find how much the bottom line slants up, and draw it; next how much the top slants down, and draw that. The top and bottom will meet at length, and *the place where they will meet will be in the eye-level line.* The line *b h* will also meet the others in the level, and all horizontal lines parallel to each other meet in the same line and the same place. Note the distance above and below the level on the left-hand edge of the paper. The space above eye-level should be half that below, which divided into two equal parts will show where *b h* should be drawn to.

Get the width, as in Lesson I., but measure along the level for it, not the top or the bottom.

Measure also for line *e j*, taking care that the front half of the board is rather wider than the other half.

Special care must be taken to see that each scholar has drawn the lines *e j* and *f i* upright.

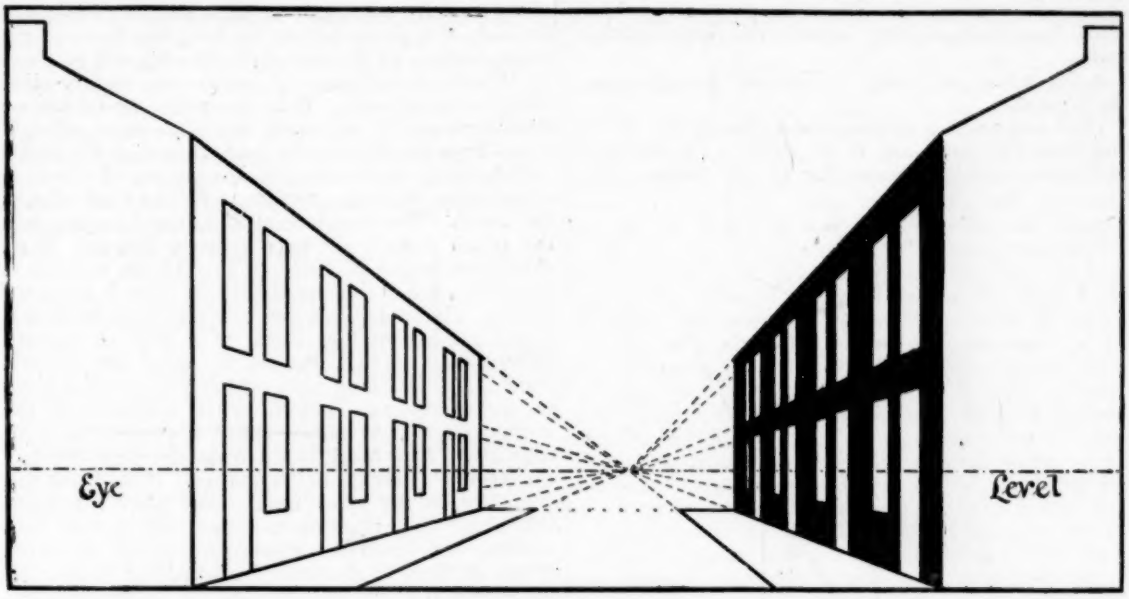


Fig. 7.

Let the class copy as an exercise in vanishing lines, using rulers, if thought advisable. A long street would look very small at the further end, and vanish to nothing, if long enough. Fog often prevents such an extended view. Fog is composed of blacks, dirt, and damp. Let there be no fog, *i.e.*, no blacks, dirt, or damp on the papers.

LESSON IV.

Repeat—

1. A horizontal line level with the eye is drawn level on the paper.
2. All horizontal lines run into the eye-level.
3. Parallel horizontal lines meet together in the eye-level.

Refer to railway and tram lines vanishing in the distance, walls, houses, lines of street lamps, etc. Show or sketch large drawing, illustrating vanishing horizontal lines. Look in reading books for pictures in which the same principle may be seen.

Hang some other map, not a square one, in some other position, and proceed with it, as in Lesson III., adding the position of the nail and string.

The nail will be above the centre upright line—*a c* greater than *c e*, *a b* greater than *d e*, but not so much greater as not to leave *b c* greater than *c d*.

Other examples can be used till this part of Model Drawing is well learnt; for instance, window, door, cupboard, or cupboard door opened at suitable angle.

LESSON V.—HORIZONTAL SURFACES.

Place a blackboard on the seats of two chairs oppo-

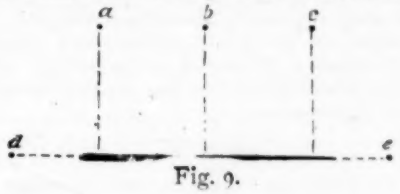


Fig. 9.

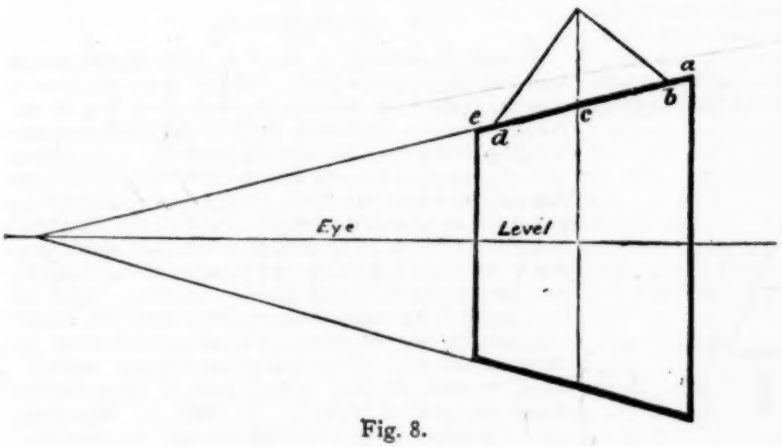


Fig. 8.

site the middle of the class—not to be used as a model, but to serve as a low table. Lay a pointer or other stick, about two feet long, on the blackboard in various positions.

1. Place boys at *a*, *b*, and *c*—they look straight *across* the pointer—their line of sight in each case crosses it at right angles. Which boys in the class do the same? Alter pointer several times till all in the class have been able to recognise the position. A pointer or line so seen is drawn on the paper as a *horizontal line*. Hold pencils to cover the pointer—

the pencil is horizontal. Draw the pointer as a horizontal line, distinguishing between the thick and thin ends.

2. Place boys at *d* and *e*. They see straight *along* the pointer.

Hold one end, *A*, as the pointer lies on the board, and cause the other end, *B*, to point to various parts of the class in succession, so that all the children may

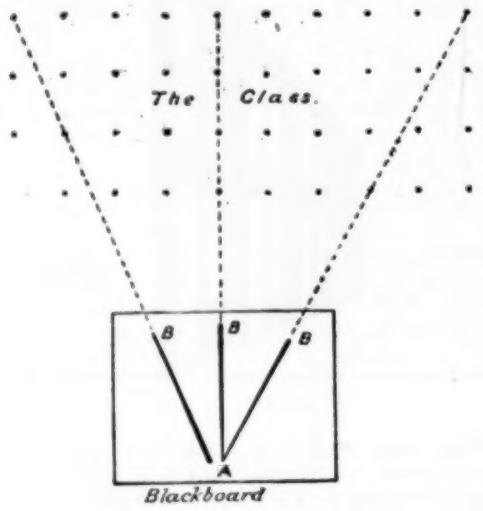


Fig. 10.

look straight up the pointer, holding up their hands when they do so. Hold pencils to cover the pointer—the pencil is *upright*. Draw an *upright* line to represent the pointer. The *bottom* end of the line is the *nearest* end of the pointer. Show whether it is the thick or the thin end.

Repeat from beginning, drawing chalk lines on the board instead of using the pointer, and letting the class draw either a horizontal or an upright line on their papers when they see a line on the board in the corresponding position.

Lesson VI.

Board on chairs as in last lesson. Another board wanted for drawing on. Only that part of the class who see across the front edge of the board at right angles to draw from it according to their own view, the rest to copy from teacher's sketch on the other board. They must try to understand what they would see and do if they, like the others, were sitting *in front*

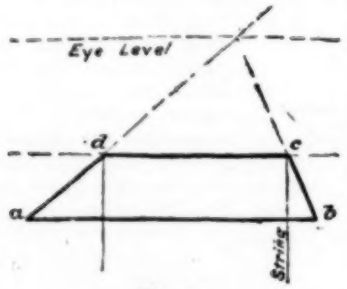


Fig. 11.

of the model. *a b*, the front edge, will be a horizontal line—draw it about four inches long, low down on the paper, because all the rest of the drawing will be above it. Divide it by means of marks very lightly made into four equal parts. Hold the pencil upright to see how much pencil will reach across the board, straight across from the front to the back, then turn the pencil (still holding the thumb at the measurement taken) to a horizontal position coinciding with the front edge of the board. The thumb being at *b*, how far along does the pencil reach? Perhaps about a quarter. If so, draw another line parallel to *a b*, and as far above it as is equal to one of the four equal parts, that is, a quarter of *a b*. The second line must be very thin, because it is not yet known how much of it will be wanted. Whereabouts in that line are the other two corners, *c* and *d*? Fix a long piece of thin string with a drawing-pin to corner *c*. Let one of the scholars hold the string straight, and notice where it crosses the front edge *a b*. How much of *a b* is on the right-hand of the string? Perhaps half a quarter. If so, mark half a quarter on the paper from *b* and place *c* straight behind it. Let others do the same, each in their turn noticing how much of *a b* the string appears to cut off. When all have by this means marked the point *c*, let them draw the end of the board *c b*. Remove string to corner *d*, repeat the process, draw *a d*, strengthen *c d*, and the board is finished (neglect thickness).

b c and *a d* are horizontal lines running away at an angle. They are parallel. Where will they meet if long enough? In the eye-level line. Produce them faintly till they do meet, and draw the eye-level as a horizontal line passing through the meeting point. Repeat with another portion of the class, till all have had their turn. In the next lesson the eye-level line will be used to obtain the vanishing lines.

(*To be continued.*)

COMMON-SENSE LESSONS IN EVERY DAY HOUSEWORK.

BY MRS. E. A. SHARMAN,

Lecturer to the National Health Society,

Author of 'Family Cookery.'

Paperhanging.

Before beginning to paper a room it will be as well first to practise a little. Cupboards are sometimes papered instead of painting or white-washing them. As a bedroom cupboard is used for nothing but hanging clothes in, it is usual to paper it. Odd pieces of wall-paper can be used up very conveniently in this manner, and are not much noticed, especially if the pattern is small and the colours delicate. In deciding to try your hand by papering a cupboard first, you will at least learn how to paste paper evenly upon a wall, to cut and fit it, and match a pattern. Begin by tearing off all the old paper, sweeping the walls down, and dusting the woodwork. If this is not done at starting, the dirt which lies upon the old paper is liable to soak through a new one, if thin, which would of course spoil it; as well as regarding such a method from a sanitary point of view, the

process of laying new paper upon old could not be called a *clean* one. If all dust is first removed there will not be so much danger of smearing the new paper, should you be a little clumsy when first attempting this sort of work. Make your mind up when beginning, that you will be as particular in doing the wardrobe cupboard as you will be when papering a room ; by so doing you will make a good start, which will only require more practice to make you a good hand at papering rooms.

Paperhanging is pleasant work, and I do not suppose that there are many cottage housewives who, when cleaning-down time comes, do not try their hand at the work. It will be a great saving of expense by knowing how to do the work yourself ; you can take your own time in doing it, and your house will always have a clean and neat appearance.

Wall-papers can be bought so cheaply nowadays that there is no excuse for the most economical housewife not keeping her home bright and pretty. Good strong wall-papers are best to choose; they do not wear and tear so soon, and if you purchase at a good shop, you will find nothing but good patterns to select from. If you should feel timid even at papering a cupboard, try a box : that is a simple thing to paper. Or if you are only partially succeeding with the cupboard, and the paper sticks and tears when folded wet, or you cannot hang it straight, nothing can be easier than to practise upon a box. The pieces of paper required for the purpose should be cut into short lengths, which will not be difficult to handle, and cannot be made too damp when pasting, because of the shortness. You will only have to match the pattern, press out all wrinkles, and smooth the whole of the work with a soft dry cloth, being careful not to smear, which is easily done when the paper is damp ; so do not touch the surface more than can be helped. Leave the box to dry until next day, when on examining it, if no fault can be found with the finish, you may take heart and try again with your cupboard, and you will be able to execute the work with more ease and success. Much depends upon the way you fix your *first* length of paper, as if not straight, of course all the other lengths will follow in the same way. Try not to *half do* the work, face all the possibilities attending it, and you will be on the way to certainty of success.

To Paper a Room.—When you think yourself competent to undertake the papering of a room, it will be as well to bear in mind that your work is likely to be criticised by your friends, so that you will need to be most particular from beginning to end, especially if it is the parlour you are attempting to beautify. Begin by taking up the carpet, and removing all light articles of furniture out of the room. Heavy articles can be covered over with dust sheets or newspapers. Pictures must be taken down and ornaments put aside. If the chimney of the room requires sweeping let it be done now ; then sweep all dust off the ceiling, walls, and floor, and whitewash the ceiling. Tear off every portion of the old paper. If you find this difficult to do, soak the paper first by washing it over with clean water, using the whitewash brush for the purpose. It can then be pulled off easily with your hands, or some sharp instrument, as a broad knife or a scraper. If there are any cracks in the walls or damp parts they must be made good. Cracks should be stopped with plaster, and damp may be rendered impervious by covering the part over with specially-prepared damp-proof paper. All such repairing should be allowed to become dry and firm before the wall-paper is laid on. In the meanwhile you must measure the walls, so as to know how much paper will be required. Wall paper is bought in 'pieces' of so many yards—usually twelve; but as the ends are often damaged, it will be better to say eleven yards to each 'piece' of about twenty-two inches in width. If you find it difficult to estimate the quantity of paper required, you would be helped in your reckoning if you first counted the number of widths of old paper before stripping it off the walls. Measure the height of the room, and you will easily calculate the number of yards wanted. If you are using a paper with a large pattern, there will be a great deal of waste in matching it when cutting the lengths, which you must make allowance for when purchasing. A paper with large pattern is much more difficult to hang than one with a small pattern. If the room is at all crooked, any little irregularity in matching the pattern will be seen at a glance, and the lines of paper at the top would not run straight, which would be a great eyesore. If the paper is a cheap and thin one it will be easily torn by a novice when placing it. Torn parts are difficult to efface in large patterns. A small pattern is more economical, and makes the hanging of it easier.

To Make Paperhangers' Paste.—Put one or two pounds of common flour into a basin or pan, or as much as you think will be required to finish the work ; add as much cold water, stirring well, as will make it into a thick paste. Rub all lumps out, and add, little by little, as much *boiling* water as will make it as thick and smooth as gruel. If the boiling water is poured on from a kettle, there will be less chance of the paste being lumpy, which must not occur, than if poured from a saucepan. The thing is, to stir vigorously when *first* pouring the water upon the flour, and to be quick in pouring all the water required, or the paste will not thicken properly, if you are slow in making it. If lumpy, strain through coarse canvas. There is no need of *boiling* the paste—most paperhangers do not—and it adheres to the wall as firmly as when boiled, thus saving some trouble. It is better and easier to work with the paste rather thin, than too thick ; when cold it is ready for use. You must lay the paper upon a long kitchen table or top and trestles when pasting it. Sometimes, when the floor of the room has been made very clean, it can be used instead of a table ; and whatever you use must be close at hand. If you were to paste the paper in the kitchen and carry it to the room, it would become soaked, and made too damp by such a process, and thus tear in pieces while you were hanging it. If the paper does not stick well to the wall, draw it away, and brush the wall over with a little paste. Having made the paste and got the table in readiness, take a 'piece' of paper into your hand, unfold a little of it, hold the portion in your hand, and let the roll run out upon the clean floor, cut off the plain edge of the paper on one side, to the length of about two yards, rolling the cut length up, before any more edge is taken off, or the paper will be creased in the process. When you have cut all the 'piece' in this manner, do the same with the others, and the paper is then ready for use. Choose a long and sharp pair of scissors for the purpose, and be care-

ful to cut the edge off close to the pattern, without making notches in the paper. Now measure the length of the wall, then cut off a portion of paper of the same length, and from this length all others must be measured, until the required number of lengths have been obtained. When measuring and cutting, it should be remembered that the pattern at the top and bottom of each length must be matched. There is sure to be a little waste, which should be cut from the lower end, or that part of the paper which will touch the skirting. The top must be made to match very exactly, or the pattern will look awry on the walls. Take care of the remnants of paper; they can be used up in places where shorter pieces will be sufficient. Lay several lengths one on the top of each other upon the table, and fix the edges so that they project over each other on one side, in order that the paste may not touch the figured surface. Brush the top length over quickly with the paste, using a white-wash brush for the purpose. Cover every part carefully, but do not soak the paper; this is a most delicate operation, and you must be quick over doing it. Fold the paper loosely back to about half its length before attempting to hang it on the wall, and fix it at the left-hand corner of the room first, pressing the top part to the wall, and unfolding the lower half gently as you proceed. The first length requires the greatest care in fixing, so that it may hang straight and perfectly upright. When the length has been placed, mark the top and bottom of the paper with the back of the scissors, then draw it gently from the wall, and cut it straight off by the line. Use a soft clean cloth to press the paper to the wall, getting out all air-bubbles, and smoothing the whole down from top to bottom with the cloth, which, if it becomes damp or dirty, must be replaced by a clean one. Do not touch the surface more than is necessary. All the smaller portions of the wall are done last. It is as well to have plenty of old clean rags at hand for pressing the paper. If there is any difficulty about getting air-bubbles from underneath the paper, draw it gently away from the wall, beginning at the bottom of the length, then press it upon the wall again in small portions. A roller can be bought cheaply for the purpose instead of using cloths; it finishes the work off more evenly than dabbing it with rags. If, in spite of all pains taken, the top and bottom of the paper does not run even, finish your work off by placing a neat paper border round the skirting and top of the room; you will so cover up all deformities, and give a finish which would be difficult to obtain otherwise.

IN THE BABIES' ROOM: WHAT TO DO, AND HOW TO DO IT.

By J. W. Warren,

Inspectress of Infant Schools, Leicester School Board.

Were it not that I had made my meaning plain in the first paper written, I should feel an apology was needed for introducing another very cheap amusement this month. But I keep country schools before my mind's-eye, and hope to afford them some little help. This paper will explain Occupation 8.

Bean or Shell Placing.—This play will greatly aid the first steps in *number* and *form*, and gives a maximum of movement with a minimum of result in size of form; it can be worked with the ordinary *cowrie shells*, *haricot*, or even *horse-beans*. The cowries will cost about *five shillings*, to supply a large class; the haricots, for the same number, about *tenpence*, and in the country any farmer will give teachers a gallon of horse-beans, so no possible excuse on the score of cost need keep the play out of a school a day longer.

Buy a half-gallon of large haricots; these will answer your purpose even better than cowries, because they will lie on either of two sides; and, again, they are, when prepared for market, of a beautiful ivory whiteness, that forms a striking and pleasing contrast with the desks or slates, upon which they are used.

Mode of Use.—Give to each child a handful in a halfpenny tin-saucer, *referred to before*.

Take for your lesson any practical subject already known to children; for instance, babies have played the game of *Fishes in a Pond*, or *Railway Train*, or the *Beehives and Bees*. We will, bean by bean, place the form of a *hive;* it will be found to correspond exactly enough for our purpose with the pothook; *two hives* with the letter n (don't say so to children). Now we will make bees flying *into* the hive, and some near the opening; those near can be few, those far in lines of flight. Little ones while placing the bees *hum*, and leaving off sing *song of the game*. (Note.—The beans should show the outline of the hive only, and the object is to teach the child *form* by means of accumulated material.)

Teacher invites the children to another form. Some very small children will quickly suggest other things, finding in their hands so ready a material. Variety is gained in the same occupation by close or distant units of material, this should be also in accordance with the object made; *bees* may be apart, all beans used in the hive must *lie close together*, as in the nature of the hive.

The oval or ellipse makes a good *pond*, and should be placed by beginning where the script *O* would be begun; fishes placed should be of the smallest beans and few in number. Some sort of conversation should take place, not forced upon the baby-workers, but to form a running accompaniment to the work. 'We will begin our bank here—it must be strong, made of stones, mud, and bushes; in the bushes we may find a bird's pretty nest; some little birds build by the cool water's edge, so do ducks.' Babies, let us make one nest (place two or three beans in position for this, and give a few grains of sago or tapioca to do for eggs; place a big duck there too). 'Now we will finish our pond—' let them do this bean by bean, carefully. A few dark seeds will serve the place of water-fowl, or scarlet-runner beans coloured ducks, and so on; a bunch of leaves brought to school, and given round, help in a very realistic way to give colour and life to the banks. Many good young teachers of the writer's acquaintance never lose a chance of putting life and interest into their work by this means—'Verily, they have their reward,' may we not say?

Something should be said about the size of things made. It will be well, in nearly all cases, to employ the space in front of each child. Thus, a pond, *O*, might be roughly considered to measure eight inches in length and six in width. All work for little ones should be of exaggerated size. A square garden-plot should have at least seven-inch sides, due atten-

tion being always given to just proportions, however simple your play.

Do not choose plays for placing that will confuse by too many subjects; units must be *massed* if in large numbers. Tram-lines, flocks of sheep, flights of birds, bunches of grapes, squares, spheres, ellipses, crosses, are the most suitable for forming.

The last five minutes let the babies work as they like, but inquire into their forms, and try to be genuinely interested in what they have done.

Star forms can be easily placed with this material, and it is, perhaps, needless to add that all written and printed letters can be formed. It will be better to keep the actual letters under their assumed names, as in the fish-pond, otherwise your mind will stray too much in the direction of instruction, and the baby-fingers and baby-brains will be forgotten.

I feel that I cannot leave this subject without giving a hint on 'First Aid.' It is more than possible, it is highly probable, that some mite of humanity may manage to snuffle up a bean, or poke it down his ear, or swallow it, especially if his teacher be at all careless. Remember, a bean is dangerous, because it swells in moisture. Take the child at once to the head mistress. A little pepper forced up the empty nostril—the finger pressed above the bean in the other to prevent an upward movement when the child is about to sneeze—will often cause the bean to fly out in the act of sneezing. There are several other methods, equally effective. A swallowed bean may be recovered by tickling with a finger the uvula *at once;* but I only wish to impress upon young teachers the great need there is of some First Aid knowledge to them. A baby child is never safe from accident, and should never be expected to take care of itself. Next month I shall devote my remarks to Play with *Clay*, dealing with the keeping and preparation of clay, rather than with the modelling, which belongs to a larger growth.

Readers of the May issue please read *right* on line 15, second column, instead of *left*.

NEEDLEWORK FOR PUPIL TEACHERS.

BY MISS SOPHY LOCH,

Examiner of Needlework to the London School Board.

(*Continued.*)

FIRST YEAR EXERCISE.—*Make a band three inches long and one inch wide. Join two pieces of calico together by a sew and fell seam two inches long. Gather and stroke a length of six inches and set it into the band. Put on a tape at the end of the band.*

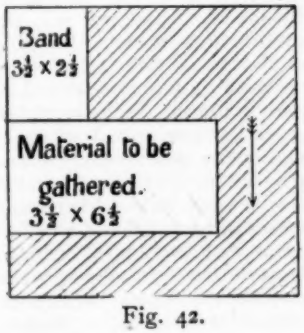


Fig. 42.

Time allowed, one hour.

Material, 9 × 9. The arrow marks the way of the self-edge.

After the band and piece to be gathered have been torn off, the two pieces required for the sew and fell seam can be easily procured from the calico remaining over.

The first thing to be done—after having ascertained the way of the self-edge, and marked it with a pin—is to tear off the little band, which must measure 3 inches long and 1 inch wide when made, and must therefore be torn off 3½ inches long, and 2½ inches wide. When this has been done, the piece must be pulled perfectly straight and even. The two longer raw edges must then be turned down even to the thread to the depth of about a quarter of an inch, and the same must be done to the two shorter sides. The material must now be doubled lengthwise even to a thread, and the folded edge pinched between the finger and thumb to make it lie quite flat. This forms the band, which must be carefully tacked, great care being taken that the corners are neat.

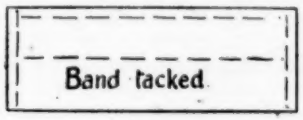


Fig. 43.

It is a good plan—as has been mentioned in a former paper—to tack bands down the centre as well as at the top, as it keeps them from being twisted when the gathers are set in. The ends of the band must now be sewn up in the usual way, the sewing beginning at the bottom of the band. Care must be taken that the sewing is worked from right to left, not *left to right*—a mistake which often arises in sewing up the ends of bands, and one of which the worker is, as a rule, quite unconscious. The tacking threads may now be taken out, with the exception of those down the centre of the band. After the latter has been halved and quartered it is completed. The piece of material to be gathered must now be prepared; the two short sides must be turned *twice* and carefully tacked. About a quarter of an inch on each side should be allowed for this in tearing off the piece, as seen in Fig. 42.

The different points to be observed in gathering, stroking, and setting-in have been spoken of in a former paper. Still it may not be amiss to briefly recapitulate them now. They are:—

1. The gathering stitch should be about a quarter of an inch below the raw edge.
2. The material to be gathered must always be halved and quartered, as well as the band.
3. The eye end of a darning needle should be used for stroking, and held in a horizontal position.
4. The gathers should be stroked both *above* and *below* the gathering thread.
5. The gathers are better fixed by pinning, not tacking.
6. The setting-in stitch must be upright, and the work must *not* be held as for hemming.
7. The setting-in stitches on the wrong side must fall on, or a trifle above, the front stitches.
8. Great care must be taken in fixing the back of the band.

The only thing that now remains to be done is to put a tape on to the end of the band, and to prepare and work a sew and fell seam of two inches, which is so

simple it hardly calls for any comment, except to say that it should of course run the self-edge of the material, and that the piece of material which has been turned down twice should be held next the worker.

The tape has now to be placed at the end of the band. The raw edge of the tape must be turned down once, and then the square of the tape found in the following manner.

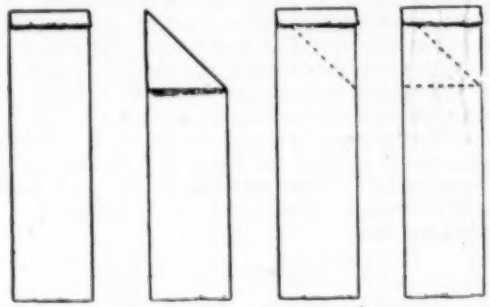


Fig. 44 (*a*). Fig. 44 (*b*). Fig. 44 (*c*). Fig. 44 (*d*).

Fig. 44 (*a*). Tape turned down once.

Fig. 44 (*b*). Turned down end folded over to the left, and then turned back, when a crease, as shown in Fig. 44 (*c*), will be seen.

Fig. 44 (*d*) shows crease marking the square.

The tape has now to be placed at the end of the band on the wrong side and carefully fixed.

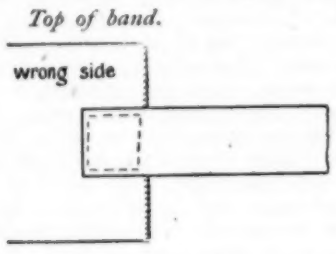


Fig. 45 (*a*).

Fig. 45 (*a*). Tape tacked on to end of band.

It must now be turned back and seamed to the band on the right side.

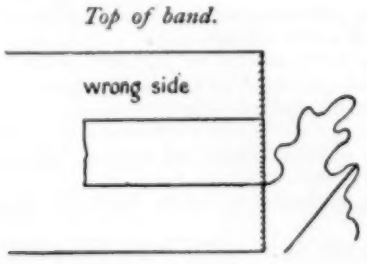


Fig. 45 (*b*).

Fig. 45 (*b*). Tape turned back and seamed to end of band.

After being seamed to the end, the tape is again reversed and hemmed to the band, the stitches not being allowed to show through on the right side of the band. Fig. 45 (*c*) also shows the method of getting rid of the end of the cotton after it has been fastened off.

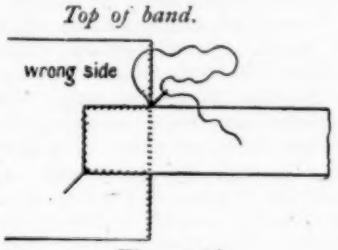


Fig. 45 (*c*).

Fig. 45 (*c*). Showing tape hemmed to band, and the needle being passed between tape and band before breaking off.

The only remaining thing to be done is to hem and seam the end of the tape. Fig. 45 (*d*) demonstrates the method of passing needle through the hemmed end before breaking off cotton. The exercise is now complete.

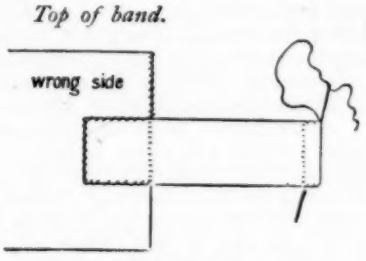


Fig. 45 (*d*).

Fig. 45 (*d*). Showing the end of tape turned down, hemmed and seamed, and the needle passed through the end before the cotton is broken off.

DECORATIVE NEEDLEWORK.

BY MAY MORRIS.

Choice of Material.—As a rule, the ground on which you work should be subordinate in quality to the work itself. It is by no means necessary or desirable that your material should be always costly; some of the most beautiful work I know is done with linen-thread on a loose linen, the beauty of the work depending entirely on the richness of design and inventive fancy of the stitches. This choice of material will no doubt be partly a matter of temperament: I mean, whether the embroideress elects to use rich and glowing materials and colours, or something simpler and cooler. But the use for which the embroidery is finally intended will determine to a great extent what shall be used. For instance, nothing could be too rich for the decoration of church-vestments for festival services; while for a homely wall-hanging, to be used daily to keep out a draught, one would probably think a loose woollen hanging worked gaily in coloured wools good enough. But, whatever you use, be sure that it is good and the best of its kind; avoid showy cheap silks and satins with cotton backs, and such unpleasant materials as 'Roman

satin' or 'oatmeal cloth,' the very touch of which is enough to put one's teeth on edge for six months. Good coarse linen is by far the best material for ordinary work, but of woollen stuffs, fine broadcloth will often be found serviceable, though more suitable for *appliqué* than for stitches laid directly on the stuff. Rough serge, rather open in texture, is not a bad ground for simple work, but it is difficult to keep from moths, and I must confess to a personal objection to the handling of this material. For *close* wool-work, which after all is much more worth doing, use a linen ground, and always put it in a frame; for fine work of this sort when worked in the hand, cockles and curls up in a quite distressing manner. Linen, as the universally approved ground-material for needlework, deserves a special word of notice. I do not want to be discouraging, but must warn you that it is really difficult to find a good firm linen, of which the thread is not beaten and impoverished out of all knowledge, nor the surface dressed and whitened for the ordinary market. I don't want to advocate nothing but hand-made linen, but wish that there were a demand for and consequently a supply of this particular texture I am describing, for at the present time one has no choice between the hard paper-like surface of ordinary linens of commerce and the fine hand-spun and hand-woven linens which are occasionally produced by enthusiastic amateurs, but whose production on a small scale necessarily makes them too costly for ordinary use, though some of them are charming materials. The linen one wishes for is a loose and supple texture, yet firm and well woven, and not too white. There is no reason that I can see, that this, or something similar, should not be woven in power-looms now, as it was formerly in hand-looms, except that there is little or no demand for it. The mechanical process would no doubt take away some of its quality, but not so much as might be thought, if more attention were paid to the excellence of the fabric than to the quantity produced in a given time at the cheapest rate possible. Linen must be very fine and white to please modern housekeepers, who, I suspect, would be much surprised if they could see and handle the 'fine white linen' of the ancient writers, so coarse and rough would it appear to them, or the 'cobweb lawn' that the impressionable Herrick sings of as part of the seductive attire of his Julia, nowhere near, I fancy, in quality to the gossamer textiles that we women demand now of the ever-inventive power-loom. Certainly, some of these modern fabrics are delicate and beautiful, and not without a certain character of their own, which does not fit them, however, for our needlework purposes. Though a good linen is the king of all materials for a ground for needlework, you will also sometimes want to employ silk for the same purpose. The choice of silk needs some experience, for one needs to be wary to select from patterns of all sorts of showy, rich-looking silks, something fit to place elaborate and costly work on. For this purpose it is absolutely useless to choose anything at a low price, however invitingly rich it looks. Like many other goods, cheap silks are made to sell and not to wear, and though they are good enough for gowns that are discarded as soon as the fashion changes, such things are worthless for embroidery, and begin to look shabby before the work is half done. Good pure silk is very flexible to the touch, and its shine is more soft than brilliant. Silk velvet is no longer made of the special texture which would render it a pleasant ground for working, and it must always have been rather troublesome to manage. The material formerly made was loosely woven, and therefore soft in texture and full of sheen; I am afraid it would be pronounced poor and thin by a modern connoisseur, but it was very pretty stuff all the same.

Canvas and net, open textures of linen or cotton, or more rarely silk, are sometimes used, peculiar and characteristic treatment being necessary for such stuffs. The canvas can either be used as a ground to be entirely covered with work in some close mechanical stitch, or be worked openly showing as background, the colours chosen being brilliant but few and simple. It was a favourite material with Renaissance needleworkers, who used it boldly and with splendid effect.

We have discussed elsewhere the merits of silk-thread, gold and silver, linen-thread, etc., and I will only remind you again—it is impossible to repeat it too often—that whatever material you choose should be, of its kind, the best you can procure. If you cannot pay for the purest gold-thread to enrich your work, be content without any gold at all; if for a large piece of work silk seems too great an outlay, use wool, but never be satisfied with an inferior quality of any material pretending to be just a little better than it is. You will always discover the inferiority first or last, and will run the risk of being discontented with your own work when finished.

Concluding Remarks.—I hope that whoever has patiently read through these papers without any previous clear knowledge of the art of needlework, practically or historically, will at any rate now distinctly rank embroidery among the many lesser arts essential to a full and pleasant life. It may be the profession of some, and merely the pastime of others, but in both cases the object is the same in beautifying and enriching both home life and public life. The decorative instinct in man, mentioned elsewhere, is not to be considered lightly, for it involves in great measure the history of the whole human race, their constructive faculty, their power of expressing their passions and sympathies, their dramatic or story-telling faculty. The decorative art of embroidery takes its due place among the arts of weaving and of fashioning stuffs into garments, and into hangings and decorations for house and hall and church. For needlework, so far as it is decorative, is put to three uses, for the adorning of houses as aforesaid, for personal adornment in the ornamenting of gowns and the small trifles that a tasteful woman likes to have about her, and thirdly, for the adorning of buildings devoted to communal life, for church vestments, banners of state, and the like. As regards house-decoration, I hope no word of mine will inspire an enthusiast to fill her home with knick-knacks of the sloppy 'art-needlework' description—embroidered covers for Bradshaw's Railway Guide, tea-cosies, those dust-traps known as mantel-borders, and similar desolating trifles. This is not at all what I mean by home-decoration by embroidery, which should bear the same stamp of good workmanship (that is, of artistic merit), the same dignity and thoughtfulness as the pictures on your walls, and the carved or moulded stone or woodwork of your fireplaces. The good feature (and the bad one too, as it sometimes appears) of embroidery is that, from its simplicity of tools and methods, it is more within the reach of the amateur than many other arts; the amateur must for that very reason treat it with some seriousness, that it may again hold its former rank

among the lesser arts, which it can never do in the frivolous and stingy 'knick-knack' stage of its existence. There are many things that can be thus decorated without desolating the aspect of a room on the one hand, or launching out into very lengthy and costly work on the other. There are table-cloths that are intended for holiday use, cushion-covers, cloths for the sideboard, and many such things that really *need* a little decoration; and if your work among the household goods may not be rich and costly, let its characteristic be simplicity and good honest solid work, which you will grow to love, to the discarding of lazy makeshift stitches.

Needlework is eminently adapted for dress decoration also; but here I am well aware that modern fashion opposes itself to the serious aspect of the art. No woman cares to spend much time with her needle on decorating gowns that next month will be out of fashion. Nothing gives such grace and distinction to a pretty gown as a little fanciful work about the neck and sleeves, giving the stamp of the wearer's own individuality to the gown itself. Of course, gowns so decorated should be cut on the most simple and dignified lines, and out of the best materials; but if there was less of that vulgar idea about, the fear of being seen more than half-a-dozen times in the same gown, even women with slender purses, by having a smaller wardrobe, would be able to choose richer stuffs. I do not think the ladies of a mediæval court would be in a hurry to part with a gown 'embroidered with lions,' or the surface 'fleur-de-lisé,' that is, powdered over with flower-de-luce, the hem curiously wrought with scenes from the lives of the heroes. Ladies who possessed such handsome state clothes, indeed, often bequeathed them to the church of their patron saint. Compare such robes with the state dresses made by a modern court dressmaker, and consider in which the greatest beauty and suitability lies!

Modern church-work has taken a stereotyped traditional form; but there is no reason that it should differ from secular work; except, that for ceremonial habits and hangings it is suitable to use richer stuffs and spend more labour than for personal decoration. In the times when church embroidery was at its best and richest, secular embroidery was equally beautiful, or nearly so, and of just the same character.

As regards suitability of purpose and the limitations of the art, common sense will tell you that for such and such objects embroidery makes a suitable decoration, and for such and such others an absurd and unsuitable one. The same with regard to the character of stitches used. For an embroidered book-cover, for instance, you would make stiff solid work, not liable to rub rough or soil easily. For a great wall-hanging to be seen far off or high up you would employ bold work on a large scale, a large design, and bold colour. Never lose sight of the object to which your work will be applied, and it will be successful and harmonious in feeling. Again, do not attempt more than the limited nature of the materials and slow process permit of being successfully accomplished. To realize this is to know all about the art, but you cannot begin too soon to reason about it. To understand the limitations and possibilities of his materials, that and the power of design, and the trained hand, form the sole skill of the artist or craftsman; and without this first-mentioned knowledge he is a mere machine, and will produce only mechanical goods.

WELL-KNOWN TEACHERS AT WORK.

XI.—D. FORSYTH, M.A., D.Sc.

Higher Grade Board School, Leeds.

One of the sights of the Leeds Conference of the N.U.T. was the great building erected by the Leeds School Board for their Central Higher Grade School. A considerable number of teachers inspected the premises during the Easter holidays, but as only a few were able to see the school at work, we have thought it would serve as an interesting reminiscence of the Conference, and be useful to teachers generally, to give some account of the school in working order, and of the guiding and inspiring force—Dr. Forsyth, who gives life and energy to one of the greatest, if not the greatest, educational establishment of its kind in the country.

The boldness and originality with which the school has been planned deserves special mention. Visitors are at once impressed with a feeling of breadth and capacity combined with airiness, brightness and strength—reflecting the highest credit on the minds which originated and carried out the scheme. It must have required no little faith, courage and public spirit, combined with distinguished skill, to have projected so vast an undertaking.

Twenty years ago the proposal to erect such a fabric would have been regarded as a mere dream; but to-day the school is an assured success, and we think that some account of its Principal and his school methods may be of service to our readers.

In the course of our inquiries we were pleased to observe that between the official management and the teaching staff there appeared to be a most happy and cordial relationship, which augurs well for the success of any educational scheme. The harmonious and mutually helpful relations between teachers and officials contribute to the general efficiency of the whole system.

A description of the premises would occupy considerable space. We content ourselves, therefore, with giving an illustration of the building, and with stating that the building is about 150 feet long, 90 feet wide, and over 80 feet high. Site and premises and fittings cost £50,000. In the basement we were shown the heating and ventilating arrangements—one 8 horse-power gas engine, with fans for extracting vitiated air, etc. On the ground floor there are the magnificent gymnasium, large cookery and dining rooms, class-rooms, etc. On the first and second floors there are twenty large class-rooms devoted to standard work. On the third floor special accommodation has been provided for the Organised Science School, including Lecture Theatre, Chemical and Physical Laboratories, Art rooms, etc; over all, there is a flat roof which serves as a recreation place for girls. The accommodation is for 2,639 scholars, exclusive of the workshop for Manual Instruction, which, being subject to special risks, is in a detached building.

We found it a kind of education to meet with the genial Principal of the school, and 'interviewing' in such circumstances became at once a pleasure and a profit. Dr. Forsyth is essentially a type of the Scottish teacher who combines a varied professional training with the highest university culture. He was not born

in the purple, but began his educational career in the ranks of a hardworking race. He was first a pupil teacher in the Muirkirk Works School, Ayrshire. On the completion of his apprenticeship he gained a Queen's Scholarship of the first class in the Church of Scotland Training College, Glasgow. For two years he was a student in that training college, passing all his examinations in the first class. He was then appointed assistant in St. James' School, Glasgow. Afterwards he became head master of Green Street School, which, under his management, became one of the largest schools in the East end of Glasgow, with 700 pupils in attendance.

While thus actively engaged he carried out his plan of adding to his professional training the highest culture, by attending the Glasgow University for six years. He graduated as M.A. in 1870.

After this, he received an appointment as master in the practising schools connected with the Glasgow Church of Scotland Training College, where he had been trained as a student, and a few years later he was appointed Lecturer on English Literature and Natural Science, and Lecturer on Drawing. For many years he acted as Senior Lecturer of the College, sending forth students to all parts of Scotland, who are ever ready to extend a welcome to the Doctor when on his scientific rambles.

David Forsyth

Still pursuing his university studies, he gained the B.Sc. degree in 1884.

He was also appointed Lecturer in connection with the University Extension Scheme and Lecturer in the Glasgow Technical College.

As a member of the General and Special Committees of the Educational Institute of Scotland he took a prominent part in educational movements, and being eagerly desirous to get teachers to introduce Drawing in elementary schools, he lectured over the length and breadth of the country, and his lectures are gratefully remembered as free contributions to the educational training of Scotland.

A keen student of Natural Science, he has prosecuted his geological inquiries into many remote districts of Scotland untouched by the Government Geological Survey, and has read valuable papers to scientific societies on this and other subjects.

In November, 1889, he was appointed Principal of the Higher Grade Board School, Leeds. In 1890, on the establishment of a Degree of Doctor of Science in the Glasgow University—a degree demanding an 'Honours' examination and original research—he received the highest honour his university could confer in Science—an honour as much appreciated by the Board and by the pupils as by the Doctor himself.

In answer to our inquiries, Dr. Forsyth informed us that the school was opened in November, 1889, but had its previous beginnings for boys in Oxford Place Wesleyan Schools, and for girls at the School Board offices, where the accommodation is now used for pupil teacher instruction. About 2,000 scholars are in attendance every day. All standards are taught, and Dr. Forsyth defended this arrangement on the ground that (1) it maintained the family principle, as he had children from the same homes from 7 to 17 years of age; (2) it helped in securing a uniform tone throughout the school, and (3) there was a complete system of teaching, graduated from the most elementary stage to the highest section of the school.

In answer to our inquiry: 'What is the aim of the school?' Dr. Forsyth replied—

'To solve the question of giving a high class education at a moderate charge to the children of the people. Grammar Schools are, by their fees, *class schools*, and in many cases have to do a large amount of elementary work.'

'Where does the higher education of your school begin?'

'The foundations are laid in the ordinary elementary section. Elementary Science lessons are given in every standard. French and Algebra are taken as Specific Subjects in Standard V. and upwards. Science is represented by the Science and Art Department's subjects in Standard VII. Manual Instruction is taken from Standard V. and upwards.'

'What is your opinion regarding Manual Instruction?'

'First, I think it assists hand and eye training; second, its general popularity with the boys is not without value; third, it contributes to physical training; fourth, it gives an outlet for the special likings of certain boys; fifth, it is not training for a trade, but a preparation for all occupations.'

'How do you arrange your classes for Manual Instruction?'

'The time-table is drawn up assigning a time for every class of the school above Standard IV. The teacher conducts his class to the workshop, and is responsible for the discipline, but the whole of the Manual Instruction is directly under the control of a skilled instructor and his assistant. The work is graded to suit the age, qualifications, and physical

strength of the boys. The lessons are only for one hour, as it has been found that two hours somewhat wearies the boys and renders the work in the second hour less skilful.'

'What do the boys do in the workshop?'

'In Standard V. the boys are trained to make models in cardboard, to introduce them to accuracy of hand work. They are also trained to the use of the plane and saw. In Standard VI. more advanced work is performed with plane, saw, and chisel. In Standard VII. the scholars are engaged in making joints of all kinds used in ordinary carpentry, dovetailing, etc. The boys also make little models for solid geometry, which are extremely useful, and have helped considerably in enabling the school to take a good position in this subject.

In the Higher Section we often use the boys in making pieces of apparatus, boxes, and other things required in school—in fact, in the *practical application* of the principles taught in the previous years, a kind of *applied Manual Instruction*. In all the classes such work is done from drawings—full size in the Junior classes, and made to scale in the Senior divisions. It is a special feature of the workshop that the Instructor puts on the blackboard enlarged drawings, similar to those made by the boys.'

'What are your opinions regarding the teaching of Science in Standard VII.? Can these scholars take without difficulty any of the South Kensington subjects, together with the Education Code course?'

'I would strongly object to make the Seventh Standard any part of the organised Science School. I aim in the Seventh Standard at giving a sound English education, and pay special attention to English Composition, Geography, and History, French, Algebra, and Drawing. To this course I have no difficulty in adding to the top division of the standard two Sciences, and for this purpose I select Physiology and Physiography, the one having to do with the *human subject* and the other the *world around him*. In the lower division of Standard VII. we only select one Science subject, viz., Physiography; in all cases, therefore, giving the Education Department course the first consideration. This sound preliminary training is of the utmost service in preparing boys and girls for taking the organised science school course with the best results.'

'How many Seventh Standard scholars have you?'

'Fully 500 boys and girls. Roughly, 300 take two Science subjects, 150 take one, the rest take none.'

'And could you without difficulty prepare Standard VII. children in more than two Science subjects?'

'Certainly not, as their ordinary education would suffer, and the science instruction would be of the most meagre description. My aim is to get a thoroughly sound course of Seventh Standard work on Education Department lines, and to superadd only as much Science instruction as the most promising children can stand without undue strain.'

'Why do you give preference to Physiology and Physiography as the first Science subjects to be taken?'

'(1) Because in Physiology the *human subject* is always present, and the instruction is most useful in its bearing on the elementary laws of health. (2) Physiography is an introduction to all sciences; it trains boys and girls to take an intelligent interest in the ordinary phenomena of the world round about them. My desk is seldom without specimens of stones, plants, etc., brought in by the children themselves who have been trained to use their eyes. I occasionally accompany the classes of the Higher Section on the Saturday afternoon rambles, when we gather botanical specimens and discuss various objects of interest. The Leeds County Council grant has enabled the School Board to add 70 scholarships to the school, and many of the boys and girls were the brightest scholars from the Sixth Standard of the ordinary schools; but these scholarships only began in November last. It is an ample year's work to give these boys and girls a thorough grounding in the work of Standard VII., with "first stage" work in French and Algebra and one Science subject, viz., Physiography.'

'What do the girls receive instead of the Manual Instruction given to the boys?'

'The ordinary Needlework Schedule is followed, Cookery is taught, and in the Higher Section Dress-cutting and making is demonstrated by a specialist.'

'You have an Organised Science School?'

'Yes, fulfilling all the conditions of the Science and Art department, but teaching *other subjects* in addition. It is in no sense merely a grant-earning machine. Such subjects as English, Geography and History are continued beyond the elementary school course. French, German, Latin and Greek are taught; and also Shorthand and Book-keeping. There are about 300 pupils at present in the Organised Science School, and this number, it is expected, will considerably increase. Every part of the work is illustrated by experiment and practical demonstration. The Chemical laboratory

LEEDS HIGHER GRADE SCHOOL—TIME TABLE 1891-1892—HIGHER SECTION

BOYS—I. A.

	9 to 9.45	9.45 to 10.45		11 to 12	12 to 12.30	12.30 to 2	2 0 to 2.30	2.30 to 3.0	3 0 to 4.0	4.0 to 4.30
M.	Book-keeping	Theor. Chem. (St E)	Interval	Mathematics	Latin	Dinner Interval	Shorthand	Practical Inor. Chem. (El.)	Practical Inor. Chem. (El.)	Practical Inor. Chem. (El.)
Tu.	Mathematics	Mathematics (St. I.)		Inorganic Chemistry (El.)			Workshop	Workshop	Freehand	Freehand
W.	Scripture	Mathematics (St. I.)		Sound, Light, & Heat (El.)	Latin		English	English	French	Geometry (Sec. I.)
Th.	History	Mathematics (St. I.)		Inorganic Chemistry			Geography	French	Sound, Light, and Heat	Gymnasium
F.	Scripture	Mathematics (St. I.)		Sound, Light, and Heat	Latin		Workshop	Workshop	French	Geometry (Sec. I.)

BOYS—I. B.

M.	Book-keeping	Mathematics (St. I.)	Interval	Inorganic Chemistry (El.)	Latin	Dinner Interval	Mathematics	French	Gymnasium	Shorthand
Tu.	History	Mathematics		Sound, Light, & Heat (El.)			Freehand	Freehand	Workshop	Workshop
W.	Scripture	Mathematics		Inorganic Chemistry	Latin		Sound, Light, and Heat	French	Geometry (Sec. I.)	Geometry (Sec. I.)
Th.	Prac. Chemistry (El.)	Prac. Chemistry (El.)		Inorganic Chemistry			Mathematics	Geography	Workshop	Workshop
F.	Scripture	Mathematics		Sound, Light, and Heat	Latin		English Composition	French	Geometry (Sec. I.)	Geometry (Sec. I.)

BOYS—I. C.

M.	Book-keeping	Mathematics (St. I.)	Interval	Inorganic Chemistry	Latin	Dinner Interval	Mathematics	Geography	Shorthand	Gymnasium
Tu.	Scripture	Mathematics		Sound, Light, and Heat			Freehand	Freehand	Geometry (Sec. I.)	Geometry (Sec. I.)
W.	Prac. Chemistry (El.)	Prac. Chemistry (El.)		Mathematics	Latin		Sound, Light, and Heat	French	Workshop	Workshop
Th.	History	Mathematics		Inorganic Chemistry			French	Sound, Light, and Heat	Geometry (Sec. I.)	Geometry (Sec. I.)
F.	Scripture	Mathematics		Inorganic Chemistry	Latin		English Composition	French	Workshop	Workshop

BOYS—II.

M.	Book-keep. or Latin	Mathematics (St II.)	Interval	Inor. Chemistry (Adv.)		Dinner Interval	Workshop	Workshop	Shorthand	Latin or Theor. Chemistry
Tu.	French	Art (Second Grade)		Mathematics			Theoretical Mechanics	History	Sound, Light, and Heat, or	Mag. and Electricity (Adv.)
W.	Scripture or Latin	Mathematics		Inorganic Chemistry			French	Practical Chemistry (Ad. St.)	Practical Chemistry (Ad. St.)	Practical Chemistry (Ad. St.)
Th.	French	Art		Mathematics			Workshop	English	Geometry (El. St.)	Geometry (El. St.)
F.	Scripture or Latin	Mathematics		Theor. Mechanics (El.)			Geometry	Magnetism and Electricity,	or Sound, Light, and Heat	Gymnasium

BOYS—III.

M.	Latin	Mathematics (St. III.)	Interval	French.	Greek	Dinner Interval	Workshop	Liter tur:	Latin or Geometry	Latin or Geometry
Tu.	Mag. and Electricity	Art (Third Grade)		Mathematics (St. III.)			History or Geography	French	Gymnasium	Gymnasium
W.	Latin	Mathematics		Organic Chemistry (El.)			Geometry	Mag. and Electricity (Adv.)	Mag. and Electricity (Adv.)	Mag. and Electricity (Adv.)
Th.	Mag. and Electricity	Art		Mathematics	Greek		Inor. Practical Chem. (Hon)	Inor. Practical Chem. (Hon.)	Inor. Practical Chem (Hon.)	Inor. Practical Chem. (Hon.)
F.	Latin	Mathematics		Organic Chemistry			Geometry	Practical Organ. Chem. (El.)	Practical Organ Chem. (El.)	Practical Organ. Chem (El.)

GIRLS - I. A.

M.	Scripture	Mathematics (St. I)	Interval	Inorganic Chemistry (El.)		Dinner Interval	Mathematics	French	Geometry	Geometry
Tu.	Mathematics	History		Sound Light, & Heat (El.)			French	Practical Chemistry (Ist St.)	Practical Chemistry (Ist St.)	Practical Chemistry (Ist St.)
W.	Scripture	Mathematics		Inorganic Chemistry (El.)			Sound, Light, and Heat	English	Geography	Gymnasium
Th.	Mathematics	English Literature		Inorganic Chemistry			French	Geography	Freehand	Freehand
F.	Scripture	Mathematics		Sound, Lig t, and Heat			Geometry	Cookery and Needlework	Cookery and Needlework	Cookery and Needlework

GIRLS—I. B.

M.	Scripture	Mathematics (St. I.)	Interval	Inorganic Chemistry (El.)		Dinner Interval	Sound, Light, and Heat	French	Geometry	Geometry
Tu.	Mathematics	English Literature		Sound, Light, & Heat (El.)	Greek		Mathematics	Mathematics	Freehand	Freehand
W.	Scripture	Mathematics		Inorganic Chemistry (El.)			Sound, Light, and Heat	English	Gymnasium	Geography
Th.	Mathematics	History		Inorganic Chemistry (El.)	Greek		French	Practical Chemistry (Ad. St.)	Practical Chemistry (Ad. St.)	Practical Chemistry (Ad St.)
F.	Scripture	Geography or Cookery		Needlework			Mathematics	French	Geometry	Geometry

GIRLS—II.

M.	Latin	Mathematics (St. II.)	Interval	Inor. Chemistry (Ad. St.)		Dinner Interval	Composition and Geography	Composition and Geography	Cookery or Dressmaking	Cookery or Dressmaking
Tu.	French	Art (Second Grade)		Mathematics (St. II.)			Mechanics or Botany (El.)	Mechanics or Botany (El.)	Geography	Mag. & Elec., or S., L., & H.
W.	Latin or Scripture	Mathematics		Inor. Chemistry (Ad. St.)			French	Practical Chemistry (Ad. St.)	Practical Chemistry (Ad St.)	Practical Chemistry (Ad. St.)
Th.	French	Art		Mathematics (St. II.)			Gymnasium	English Literature	English Literature	Latin
F.	Latin or Scripture	Mathematics		Botany or Mechanics (El.)			Latin	English	S.L.&H.(Ad.)or Mg.& El.(El.)	Chemistry

GIRLS—III.

M.	Lat n	Mathematics (St. III.)	Interval	French		Dinner Interval	Geog., or S., L., & H. (Adv.)	Geog., or S., L., & H. (Adv.)	Cookery or Dressmaking	Cookery or Dressmaking
Tu.	Mag and Electricity	Art (Third Grade)		Mathematics (St. III.)			Botany or Mechanics (Adv.)	Botany or Mechanics (Adv.)	French	Art
W.	Latin	Mathematics		English Literature			French	Mag. and Electricity (Adv.)	Mag. and Electricity (Adv.)	Mag. and Electricity (Adv.)
Th.	Mag. and Electricity	Art		Mathematics (St. III.)			Gymnasium	English Literature	Latin	Latin
F.	Latin	Mathematics		Botany (Ad. St.)			Latin	English	French	Chemistry (Ad. St.)

is fitted with all the apparatus necessary for Elementary, Advanced and Honours examinations. The Physical laboratory is also equipped for courses in experimental work in Heat, Electricity and Mechanics. In equipping the laboratories the School Board have been much indebted for valuable apparatus to the generous grant of the Leeds County Council, which placed at their disposal last year £3,000.'

'Is this Higher Section entirely intended for training in Science and Technical subjects?'

'Not at all. It is intended that the training should suit the future career of the pupils, and the curriculum is modified in order to meet their wants as far as practicable. For example, for such boys as desire to follow a professional career, Latin is taken; and a class of twelve take Greek. In this way boys are trained for the preliminary examination of the universities, or the Legal and Medical professions. Three girls passed last year in the London Matriculation examination in the first division, and there is every likelihood that these studies will be continued.'

'Then how is your school different from the ordinary Grammar School?'

'It differs in the first place because Classics are optional, and only taken by students who are likely to require them (the practical result being that the progress is quicker), and a fuller attention is given to the modern languages and sciences.'

'Have you any objection to supply a copy of the time-table of the organised Science School, or, as you prefer to call it, of the Higher Section of the school?'

'I shall be very glad to supply a copy.' (*See page* 15.)

'Do the girls take the same subjects in the Higher Section as the boys?'

'In the First year's course they do, with the exception of the Lower division, where the same principle is observed as in Standard VII. Pupils are not put into more science subjects than they can study with advantage. In the Second year the course is modified. As Plane and Solid Geometry does not present much charm to girls, Botany is put in its place. All such arrangements are made with the full sanction of the Science and Art Department, who entirely assent to the principle that no pupil should take more subjects than the teachers feel they are capable of doing justice to.'

HIGHER GRADE BOARD SCHOOL, LEEDS.

'I have noticed the splendid gymnasium in connection with the school. What use do you make of this?'

'A time-table is drawn up which gives to every class a certain amount of time every week, and the gymnasium, therefore, is employed at all hours of the day. The agreeable change from the day's work enlivens the scholars, and effects a marked improvement in the carriage of growing boys and girls. A whole class goes to the gymnasium at a time in charge of a teacher, who is responsible for the discipline; but the calisthenic exercises are under the charge of a specially

skilled instructor. The piano gives charm and rhythm to the movements. On several occasions there have been popular demonstrations of calisthenic and gymnastic exercises for the purpose of providing money for the school cricket clubs, etc.'

'Is the school *mixed* in the standards?'

'No. The numbers are such in each standard that not only are sub-divisions necessary, but boys are taught quite separate from the girls. At the same time in the Higher Section, where the highest classes are sometimes small, there is no hesitation in teaching boys and girls together, and with the best results. Sometimes there is an amusing and generous rivalry between the boys and girls in such subjects as Greek, Theoretical Mechanics and Advanced Mathematics.'

'Is there any provision made for the children who come from a distance?'

'There is a special kitchen for the purpose of providing dinners. The children bring luncheon-baskets with food prepared at home, and this is either cooked or warmed at school for the mid-day interval. In this way about 300 children each day are provided with a comfortable meal. Coffee, cocoa, and milk are sold at cost price; no charge is made for this accommodation.'

'What is the nature of the Music instruction in the school?'

'Practically it resolves itself into Tonic Sol-fa up to Standard V. In Standards VI. and VII. both notations are taught. This gratifying result in the higher standards is considerably assisted by the number of the pupils who take advantage of the provision made for pianoforte instruction. The excellence of the music has been a special feature of the annual concerts of the school. The fine, rich tone of voice of Yorkshire boys struck me as surprising when I first came from Scotland.'

'How does the building lend itself to the varied organisation requisite for so many branches of instruction?'

'Admirably. The spacious corridors not only afford means of supervision, but act as lungs. The system of mechanical ventilation enables the vitiated air to be extracted, whilst the pure air is admitted at an equable temperature over hot-water pipes, and the class-room system enables each teacher to concentrate his own and his pupils' attention on their work.'

'Such an immense work must require a very large, well-qualified staff?'

'Yes. Mainly trained teachers are employed, very few pupil teachers, and these chiefly in assisting in the larger divisions. There is no class in the school entrusted entirely to a pupil teacher.'

'Where there is such a large element of higher instruction are not special teachers required?'

'I prefer to work with ordinary trained teachers, who, by study, have qualified themselves for special subjects. For example, in the Higher Section vacancies are easily filled up by teachers from the elementary section who, by private study, have made themselves qualified according to the requirements of the Science and Art Department. In French and German a special teacher is required; but here again a highly-qualified Englishman is preferred to a foreigner. Several of the teachers are University graduates, and several are preparing for the Matriculation and Intermediate examinations of the London University. I look with favour on the new movement of Day Training Colleges as likely to supply more highly-qualified assistants, because they will be expected to combine professional skill with university training. I prefer that type of teacher rather than a university man who takes up teaching as an afterthought, without the practical experience acquired during apprenticeship.'

'Is the school self-supporting, or is it aided by the local rates?'

'The school is practically self-supporting; the fee grant of ten shillings per child is received, and, in addition, each pupil pays sixpence per week and also threepence for books and stationery, that is equal to thirty shillings per annum. These receipts are further supplemented by the Education Department grants of over a pound a head, and the Science and Art Department's grants, which are liberal in the organised Science School.

'Have the Board any scholarship system?'

'Yes; with several special features:—

'1. Free admission scholarships, by which 180 promising boys and girls receive free tuition and books for three years.

'2. About forty Science and Art scholarships, *founded* by the generous liberality of townsmen and supplemented by Science and Art Department's grants, enable the Board to award scholarships of the annual value of £9, £12, and £15. The Scholarship Fund is further augmented by the proceeds of the school's concerts. The last concert was held in the Coliseum, the largest building in Leeds, and was crowded by an appreciative audience; the sum of £35 was cleared, after paying all expenses.

'3. From the £3,000 granted by the Leeds County Council, seventy scholarships, of the value of £15 each for eighteen months, were awarded to scholars who elected to come to the Higher Grade School.

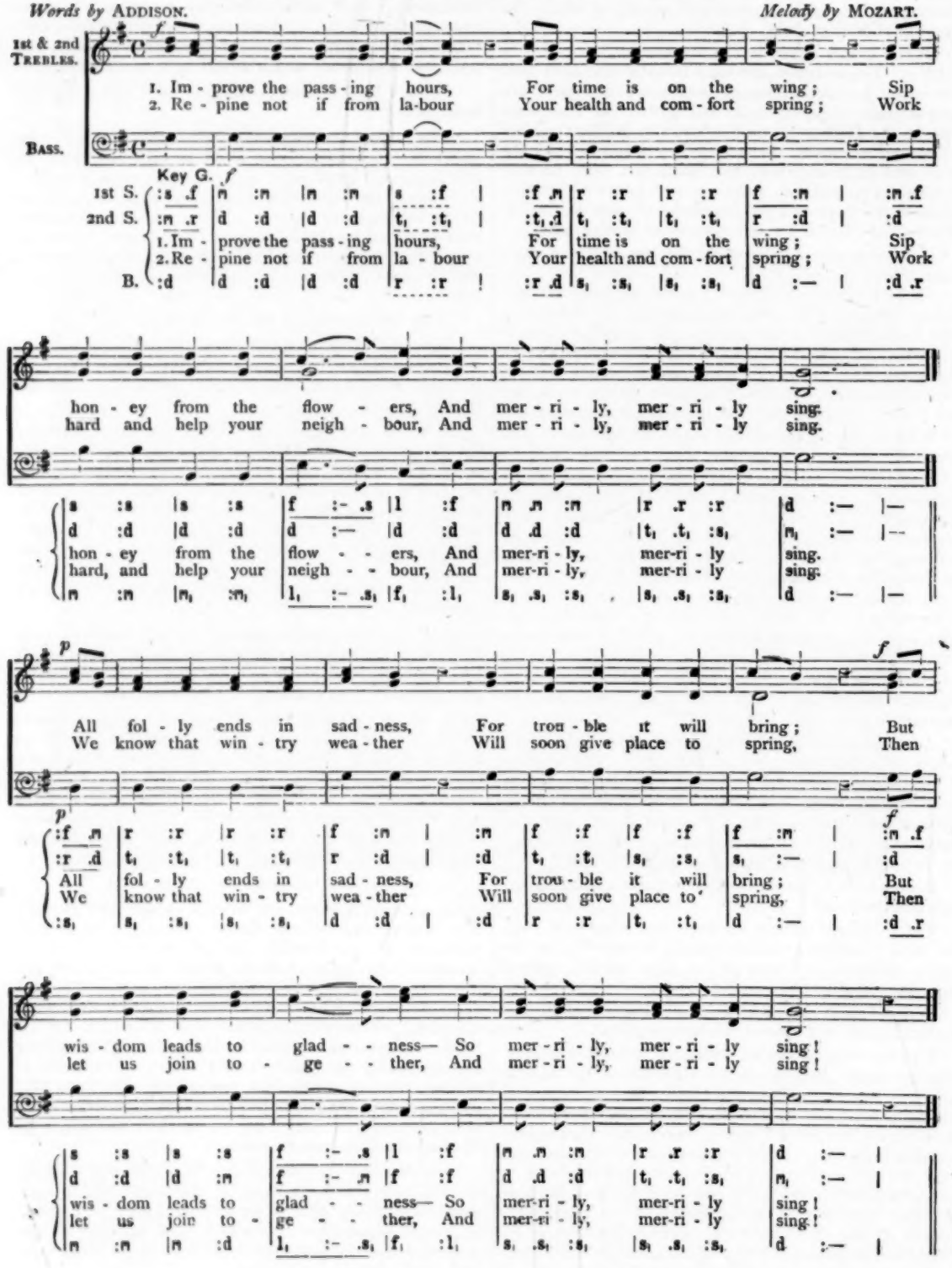
'4. Many promising children from villages outside Leeds also attend the school, in virtue of West Riding County Council scholarships, which provide railway fares and school fees. It is very important to notice that a large number of the scholarship holders are children of artizans, mechanics, and other working people, and that they all come actuated with a desire to improve themselves.'

'Is the building utilised for evening work?'

'Yes. Art classes are taught under the Board's Art Master, and Science classes are taught by several members of the Board's day school staff. Evening classes are also held for senior pupil teachers, and for students preparing for scholarship and certificate examinations. Then there are classes on Saturday mornings for drawing, science, and languages for all pupil teachers; also classes in the gymnasium and in the workshop for teachers and others. The aim of taking teachers into the workshop and into the gymnasium is that the teachers themselves may have an opportunity of qualifying as skilled instructors in Manual or Gymnastic teaching.'

In taking leave of the talented Principal of the school we could not help rejoicing at the large advantages which are being offered to the children of a great industrial population, and which will steadily lift the commercial centre of the West Riding of Yorkshire into a seat of popular learning.

IMPROVE THE PASSING HOURS.

Words by ADDISON. *Melody by* MOZART.

1st & 2nd TREBLES.
BASS.
Key G.
1st S.
2nd S.
B.
1. Im - prove the pass - ing hours, For time is on the wing; Sip
2. Re - pine not if from la-bour Your health and com - fort spring; Work
hon - ey from the flow - ers, And mer - ri - ly, mer - ri - ly sing.
hard and help your neigh - bour, And mer - ri - ly, mer - ri - ly sing.
All fol - ly ends in sad - ness, For trou - ble it will bring; But
We know that win - try wea - ther Will soon give place to spring, Then
wis - dom leads to glad - - ness— So mer - ri - ly, mer - ri - ly sing!
let us join to - ge - - ther, And mer - ri - ly, mer - ri - ly sing!

PUPIL TEACHERS' EXAMINATION.—MODEL ANSWERS.

9th APRIL, 1892.

FIRST YEAR.

BOYS.

English.

1. Analyse this sentence and parse the words printed in italics :—

But oars *alone can ne'er prevail*
To reach the distant coast,
The breath of heaven *must swell* the sail,
Or all the toil *is lost*.

Sentence	Kind of Sentence	Subject		Predicate		Object	
		Simple	Extension	Simple	Extension	Simple	Extension
A. But oars alone ..... distant coast	Princ.	oars	alone (but)	can	ne'er to reach the distant coast	[to] prevail	
B. The breath of heaven ..... the sail	Princ. Co-ordinate to A	breath	the of heaven	must		[to] swell	the sail
C. Or all the toil is lost	Princ. Adversative to A and B	toil	the (or) all	is lost			

But—introductory adversative conjunction.

alone—adj. (incapable of comparison), qual. *oars*.

can—verb, irreg., indeterminate, defective, act., indic., present, plural, 3rd, agrees with *oars* and governs [*to*] *prevail*.

ne'er—negative adverb of time, mod. *prevail*.

[*to*] *prevail*—verb, reg., prolative, intrans., infin., present, gov. by *can*.

must—verb, irreg., indeterminate, defective, act., indic., present sing., 3rd, agree with *breath*, and governs [*to*] *swell*.

swell—verb, reg., prolative, trans., act., infin., present, gov. by *must*, and gov. *sail*.

or—conjunction, correlative, co-ordinative, joins two sentences.

is lost—verb, irreg., trans, pass., indic., present, sing., 3rd, agrees with *toil*.

2. Quote three of the most important rules of Syntax, and give sentences to illustrate their use.

(1) A verb agrees with its subject in number and person.

'*I am* a linen-draper bold.'

Here the verb *am* is 1st pers., sing., agreeing with its subject *I* in 1st pers., sing.

(2) Transitive verbs govern nouns and pronouns in the objective case.

(*a*) 'I *love liberty*.' The trans. verb *love* governs *liberty* in objective case.

(*b*) 'John *struck him*.' The trans. verb *struck* governs *him* in objective case.

(3) A relative pronoun agrees with its antecedent in number and person.

'This is *he* of *whom* I spake.' *Whom* is 3rd pers., sing., agreeing with *he*, which is 3rd pers., sing.

3. (*a*) Give the plural of the following nouns :—*Sow*, *Hero*, *Ox*, *Foot*, *Axis*, *Genius*; and (*b*) give some examples of nouns which have no plural, and (*c*) of nouns plural in form which have no singular.

(*a*)

Singular.	*Plural.*
Sow	Sows
Hero	Heroes
Ox	Oxen
Foot	Feet
Axis	Axes
Genius	Genii and Geniuses

(*b*) (1) *Proper Names*, as John, Sarah, London.

(2) *Abstract Nouns*, as bravery, wrath, skill, electricity.

(3) *Names of Materials*, as gold, dirt, flesh.

(*c*) Names of things essentially composite, as archives, measles, scissors.

4. Give some other words which are formed in the same way as the following, and say in each case what is the meaning and use of the termination :—

Wid*th*, Read*er*, Man*hood*, Learn*ing*.

Typical Word	Meaning and Use of Termination	Illustrative Words
Width	*-th* = state of, used to form Nouns from Adjectives	Breadth, length, warmth
Reader	*-er* = agent or instrument, used to form Nouns from Verbs	Slayer, tinker, preacher
Manhood	*-hood* = condition, used to form Nouns from Nouns	Childhood, boyhood, widowhood
Learning	*-ing* (originally *-ung*) used to form Gerunds	Reading, writing, spelling

5. Take the following words and put each of them into two separate sentences, in the one of which it shall be used as a preposition, and in the other as a conjunction :—

For, But, Before, Until, After.

Word	Prepositional Use	Conjunctional Use
(1) *For*	This is not *for* you	I cried, *for* I could not help it
(2) *But*	Thou shall have no other gods *but* me	He came, *but* I went
(3) *Before*	*Before* him passed the young and fair	James died *before* Jane arrived
(4) *Until*	Keep it *until* morning	Tarry, *until* I come
(5) *After*	He cometh *after* me.	*After* I depart, the deluge will overwhelm

SECOND YEAR.

BOYS AND GIRLS.

English Grammar and Composition.

1. Say how many sentences there are in the following passage, and what are the subject, predicate, and subordinate parts of each:—

Shakespeare is above all writers the poet of Nature, the poet that holds up to his readers a faithful mirror of manners and of life. His persons act and speak by the influence of those general passions and principles by which all minds are agitated, and the whole system of life is continued in motion. In the writings of other poets, a character is too often an individual; in those of Shakespeare it is commonly a species.—JOHNSON.

'Still is the toiling *hand* of Care,
The panting herds repose;
Yet hark how through the *peopled* air
The busy murmur *glows!*

The *insect* youth are on the wing
Eager *to taste* the honied spring
And float *amid* the liquid noon;
Some lightly o'er the current skim,
Some show their gaily-gilded trim
Quick glancing to the sun.'—GRAY.

(*a*) The heat is so great that even the anxious labourer rests, and the hard-breathing kine remain sleepily still. The young insects, however, throng the air, and the hum of their active wings seems to increase the heat. They flit hither and thither led by their fondness for the honey of the flowers, and for spreading their wings in the clear sunrays. Part occasionally glide along the surface of the stream, and part display their resplendent plumage in the brilliant light.

(*b*) *hand* Com. noun, sing., 3rd, neut., nom., subj. to *is*.

peopled Past partic. of *to people*, qual. *air* attributively.

glows Verb, regular, intrans., indic., present, sing., 3rd, agrees with its subject *murmur*.

insect Noun used as an adj., incapable of comp., qual. *youth*.

to taste Verb, reg., trans., act, infin., gov. *spring* and modifies *eager*.

amid Prep. governs *noon*.

quick Adv. of manner, mod. *glancing*.

glancing Verb, reg., intrans, present partic., qual. *trim*.

Sentence	Kind of Sentence	Subject		Predicate		Object	
		Simple	Enlargement	Simple	Extension	Simple	Enlargement
A. Shakespeare is above all writers ..... and of life	Principal	Shakespeare		is the poet .. and of life			
A2. That holds up to his readers ..... and of life	Adject. Qual. *poet*	that		holds	up to his readers	mirror	a faithful of manners and of life
B. His persons act and speak .. and .... continued in motion C.	Two Principal Sentences	persons	his	(1) act (2) speak	by the influence .. continued in motion		
B2 or C2. By which all minds are agitated	Adject. Qual. *principles*	minds	all	are agitated	by which		
B3 or C3. [By which] the whole system of life .... in motion	Adject. Qual. *principles*	system	the whole of life	is continued	in motion		
D. In the writings of other poets ..... an individual	Principal	character	a	is an individual	too often		
E. In those of Shakespeare ..... commonly a species	Principal Adversative to D.	it		is a species	commonly in those of Shakespeare		

There are thus eight sentences—five principal, and three subordinate.

2. (*a*) Paraphrase the following passage, and (*b*) parse the words in italic:—

3. Make a list of words having the following beginnings and endings, and give the meaning in each case:—(*a*) *Per, Contra, Ex, Con, Mis, Ab, Sub;* and (*b*) *tion, fy, tude, ive, ble.*

(*a*)

PREFIXES	MEANING	COMPOUND	MEANING
(1) *Per-*	through, thoroughly	persist	to stand through, to continue
		pertain	to hold through, to belong
		perambulate	to walk through or about
(2) *Contra-*	against	contradict	to speak against, to deny
		contrast	to place against, to oppose
		contravene	to come against, to oppose
(3) *Ex-*	out of	expel	to drive out of
		export	to carry out of
		extort	to twist out of, to exact
(4) *Con-*	with, together	conduct	to lead together
		convene	to call together
		contract	to draw together
(5) *Mis-* (Fr. *mes*, L. *minus*, also A.S. *mis*)	wrong	misapply	to put to a wrong use
		misuse	to use wrongly
		mistake	to take wrongly, to be in error
(6) *Ab-*	from	abduct	to lead from
		abuse	to use from its proper purpose
		absolve	to loose from
(7) *Sub-*	under	submarine	under the sea
		subterranean	under the land
		subscribe	to write under

(*b*)

AFFIXES	MEANING	COMPOUND	MEANING
(1) *-tion*	state resulting from action	desertion	act or state of being left
		extortion	act or state of exacting
		distortion	act or state of twisting awry
(2) *-fy*	to make, to be	beautify	to make pretty
		fructify	to make fruitful
		justify	to make right
(3) *-tude*	state of	altitude	state of being high, height
		longitude	state of being long, length
		latitude	state of being wide, width
(4) *-ive*	possessing quality of	amative	loving
		destructive	destroying
		operative	working
(5) *-ble*	possessing quality of	amiable	fit to be loved
		loveable	fit to be loved
		justifiable	able to be justified

4. (*a*) Show the difference between an adverb, an adverbial phrase, and an adverbial clause.

(*b*) Add one of each to the sentence, '*The wind blew.*'

(*a*) An adverb is one word.

An adverbial phrase is a sensible collection of words equal to an adverb, and containing no finite verb.

An adverbial clause is a subordinate sentence equal to an adverb.

(*b*) The wind blew violently.

The wind blew in a violent manner.

The wind blew as violently as I ever *experienced.*

5. Say how you would explain the meaning of the grammatical term *case* to a class of children, and what sentences you would give in illustration of your lesson.

The meaning of the word *case* is a *falling*, and grammatical *case* meant a falling away from the root form of the noun or pronoun, according to the way in which the word was used in a sentence. Thus, when the noun *boy* is used to denote possession, we do not say 'the *boy* marbles', but the *boy's* marbles.' The form '*boy's*' is therefore a falling away from, or variation of, the standard form *boy*, and according *boy's* is said to be the Possessive Case of *boy*.

Similarly we say '*men's* wages' and not '*men* wages.'

In Pronouns, *Case* is more evident than in Nouns. Thus, of the word *he*, there are three different forms, viz. :—*he*, *his*, *him*, answering respectively to the Nominative, Possessive and Objective Cases, and none of these forms can be substituted for the other.

We must say '*He* did it,' not '*His* did it' nor '*Him* did it.'

We must say 'This is *his* hat,' not 'This is *he* hat' nor 'This is *him* hat.'

We must say 'John struck *him*,' not 'John struck *he*' nor 'John struck *his*.'

To explain the uses of the various Cases would be beyond the scope of the question.

THIRD YEAR.

English Grammar and Composition.

BOYS AND GIRLS.

1. Paraphrase this passage:—

I am monarch of all I survey,
My right there is none to dispute;
From the centre all round to the sea
I am lord of the fowl and the brute.
O solitude! where are the charms
That sages have seen in thy face?
Better dwell in the midst of alarms
Than reign in this horrible place.
I am out of humanity's reach,
I must finish my journey alone,
Never hear the sweet music of speech,
I start at the sound of my own.

Whatever I gaze upon, I am master of, and nobody disputes my claim. Right from the interior to the shore every living creature belongs to me.

Yet, in this lonely domination I do not feel the pleasure so praised by wise men as being therein contained.

I had rather live hemmed in by anxiety than be king of this terrible island.

Here, I can have no intercourse with my fellow man; here the pleasant sound of the human voice never greets my ears; I am alarmed to hear myself speak.

I must be companionless to the end of my life.

2. (*a*) Point out in the following verse the number of sentences, their relation to each other, and the principal parts of each.

(*b*) Parse also the words printed in italic.

There's not a *joy* the world *can give* like *that* it takes away,
When the glow of early thought declines in feeling's dull decay;
'Tis not on youth's smooth cheek the blush alone *which* fades so fast,
But the tender bloom of heart *is gone* ere youth *itself be past*

Sentence	Kind of Sentence	Subject		Predicate		Object	
		Simple	Enlargement	Simple	Extension	Simple	Enlargement
A. There's not a joy the world can give .... feeling's dull decay	Principal	joy	(there) a rest of sent.	is			
A2. The world can give	Adj. Qual. *joy*	world	the	can		to give [which]	
A3. It takes away when the..... feeling's dull decay	Adj. Qual. *that*	it		takes	away when the glow .. dull decay	[which]	
A3β. When the glow of early ..... feeling's dull decay	Adv. Mod. *takes*	glow	(when) the of early thought	declines	in feeling's dull decay		
B. 'Tis not on youth's smooth cheek ..... which fades so fast	Principal	it		is the blush ....' fades so fast	not		
B2. Which fades so fast	Adj. Qual. *it*	which		fades	so fast		
C. But the tender bloom of heart is gone.....itself be past	Principal Adversative to B.	bloom	the tender of heart	is gone	ere youth itself be past		
C2. Youth itself be past	Adv. Mod. *is gone*	youth	itself	be past			

(*b*) *joy*—common noun, sing., 3rd, neut., nom., subject to *is*.

can—verb, irreg., defective, indeterminate, trans., act., indic., present, sing., 3rd, agrees with its subject *world*, and governs [*to*] *give*.

[*to*] *give*—verb, irreg., trans., act., infin., present, governed by *can*, and governs *which*.

that—demonstrative pronoun, sing., 3rd, neut., dative case, modifies *like*.

which—rel. pro., sing., 3rd, neuter, nom., subject to *fades*, and agrees with its antecedent *it*.

is—verb, irreg., intrans., indic., present, sing., 3rd, agrees with *bloom*, and is auxiliary of perfect tense. N.B.—Verbs of motion are often conjugated with *be* instead of *have*.

gone—verb, irreg., intrans, past partic., forming with *is* the perfect tense.

is gone—verb, irreg., neut., passive, indic., perfect tense, sing., 3rd, agree with its subject *bloom*.

itself—emphatic pers. pro., sing., 3rd, neut., nom., in apposition to *youth*.

be—verb, irreg., intrans., subjunct., present, sing., 3rd, agree with subj., and is auxiliary of perfect tense.

past—verb, reg., intrans., past partic., forming with *be* the perfect tense.

be past—verb, reg., neut., passive, subjunct., perfect, sing., 3rd, agrees with its subj. *youth*.

3. What do you know of the origin, formation, and precise meaning of the following words? Place each of them in a separate sentence of your own making :—

Distributive, Pre-eminence, Ellipse, Phonograph, Intimidate Invulnerable, Graminivorous, Extempore, Overweening, Defendant, Recognition, Atheist.

(1) *Distributive* from (L.) *dis-* = asunder, *tribuo* = I give or divide, *-ive* possessing quality of. The word means *apportioning*. He showed his *distributive* faculty by his just apportionments.

(2) *Pre-eminence* from (L.) *prae-* = before, *eminens* = distinguished, *-ence* = state of. The word means *highest position*. The right hand of the Lord hath the *pre-eminence*.

(3) *Ellipse* from (GR.) *ellipsis* (*el-*, *leipo*) an omission or defect. The children may be allowed to fill up an *ellipse* in the question. What are the foci of an ellipse?

(4) *Phonograph* from (GR.) *phone* = sound, *grapho* = I write. A *phonograph* records and reproduces sounds. The *phonograph* records the sounds spoken into it.

(5) *Intimidate* from (Med. L.) *intimidatum* to frighten (*in* = in, *timidus* = fearful), FR. *intimider* = to frighten. Death cannot *intimidate* me.

(6) *Invulnerable* from (L.) *in* = not, *vulnus* = a wound, *-abilis*, active quality of. The word means *not able to be wounded*. Achilles was *invulnerable* except in his heel.

(7) *Graminivorous* from (L.) *gramen* = grass, *voro* = I devour, *-us* an adj. termination. The word means *grass-eating*. The cow is a *graminivorous* animal.

(8) *Extempore* from (L.) *ex-* = out of, *tempus* = time. The word means *without preparation*. Gladstone made an *extempore* speech.

(9) *Overweening* from (A. S.) *ofer* or *ober* = too much, *ween* = to think. The word means *too conceited*. He has an *overweening* opinion of his abilities.

(10) *Defendant* from (L.) *de* = down or off, *fendo* = I ward, *-ant* = an agent. A *defendant* is a man upon his trial. The defendant turned the tables upon his accuser.

(11) *Recognition* from (L.) *re* = again, *con* = together, *nosco* or *gnosco* = I know, *-tion* = state of. *Recognition* is knowing again. John passed his jailers without *recognition*.

(12) *Atheist* from (GR.) *a* = without, *theos* = God, *-st* = agent. An *atheist* is a disbeliever in the existence of a God. The *atheist* says, 'There is no God.'

4. What kind of sentences are those which are introduced respectively by the following words :—

Nevertheless, Since, Because, If, For, But, As, Where.

Give an example in each case.

(1) I forbade him, *nevertheless he did it.*	Adversative principal sentence.
(2) I forbade him, *but he did it.*	Adversative principal sentence.
(3) He has done his work *since you came.*	Adverbial subordinate sentence of time.
(4) He obeyed, *since he could do nothing else.*	Adverbial subordinate sentence of cause or reason.
(5) He obeyed, *because he could do nothing else.*	Adverbial subordinate sentence of cause or reason.
(6) He obeyed, *for he could do nothing else.*	Adverbial subordinate sentence of cause or reason.
(7) He obeyed, *as he could do nothing else.*	Adverbial subordinate sentence of cause or reason.
(8) *If I die*, I shall arise again.	Adverbial subordinate sentence of hypothesis.
(9) John departed *as William arrived.*	Adverbial subordinate sentence of time.
(10) John worked *as William directed.*	Adverbial subordinate sentence of manner.
(11) He sleeps *where southern vines are dressed.*	Adverbial subordinate sentence of place.
(12) This is the house *where Milton lived.*	Adjective subordinate sentence.

5. If any of the following sentences are faulty, correct them, and give your reasons :—

(*a*) The committee were divided in opinion.

(*b*) The sad faces and joyous music formed an incongruous sight.

(*c*) It was almost intolerable to be borne.

(*d*) Neither his conduct nor his language appear to me to be satisfactory.

(*e*) If that I thought he would not come
No longer would I stay.

(*f*) I rarely or ever see him now.

(*a*) The strictly correct form requires *was* instead of *were*, because *committee* is a singular noun.

(*b*) Substitute *combination* for *sight*. *Joyous music* cannot help to form a *sight*.

(*c*) The expression is inconsistent. *Intolerable* means *not to be borne*. Omit *to be borne*.

(*d*) *Appear* should be *appears*. Two or more disjunctive subjects take only a singular verb.

(*e*) Alter to 'If I thought *that* he would not come.' The conjunction 'that' should immediately precede the noun sentence that it introduces.

(*f*) Change to 'I rarely or *never* see him.' *Ever* conveys the wrong idea. *Now* may be omitted, but is perhaps justifiable.

TACT
IN THE BUSINESS OF SCHOOL-KEEPING.

BY RICHARD BALCHIN.

HAVING in preceding articles noted the mode of treatment that should be adopted in the case of certain boys who stand out from the rest by the possession of special characteristics, I will now, before proceeding to the next division of the subject, give to my readers the results of an experience of over forty years in the management of boys generally. The tact displayed here is often the one thing which distinguishes a successful teacher from one who is a conspicuous failure. Nay, further, the success in life of a family of sons often depends upon the tact shown in their general management while at home. And the principles explained in these articles, as forming the basis of the method of treating boys in school, apply with equal force to the home-life ; though, of course, it is with the former that we have now to do.

Has anybody ever seriously propounded to himself the query 'What sort of an entity an ordinary school-boy is?' To me he is an interesting creature, with certain well-marked features. It would be well to get, as it were, inside of him, to thoroughly understand his inner being, as well as its outward manifestations, before attempting his management.

In the first place, a boy, while at school, prefers order to disorder. He would rather that his class be well-disciplined than not. He is proud to know that he is a unit in a group which is made to go through every necessary movement smartly, and strictly to the word of command. And hence, a teacher makes his division or his school attractive to boys, and greatly raises it in their estimation by insisting upon thorough discipline. The assembling and dismissing must be orderly ; the same with the giving out and collecting of materials ; the cupboards must be kept tidy ; the maps and pictures hung straight. The teacher also should present a tidy and orderly appearance before the boys ; no dirty linen, nor greasy coat-collar ; no boots down at the heel nor trousers ragged at the bottom. He should be such a one, that his lads may regard with pride as well as respect.

Another well-marked feature in our young friend's nature, is a strong desire to be doing something himself ; either *for* himself, or for his class. It is very far indeed from his wish that he should sit still, passive, in his desk all day, while his teacher or someone else does everything for him. This inactivity is as distasteful to the boy as it is eminently *un*-educative. And here, let me remark, that we seem to have lost, in our modern system of school-keeping, one at least, of the virtues of our old monitorial arrangement. It may not be out of place to describe what this system was. Between forty and fifty years ago I was one of the twenty-four class-monitors in the Somers Town British School, and became in due time 'general monitor.' Mr. Gent was the master. He was subsequently appointed secretary of the Ragged School Union. The one large room was about 150 feet long by 50 feet. Desks were arranged right down the middle of the room, and fixed on the sloping floor. The space around the room between the desks and the walls was occupied by the twenty-four classes under their monitors, the whole being kept in order by the general monitor, who ran about on the desks, and occasionally blew a whistle to stop the machine whenever, in his opinion, the fearful din became intolerable. The master spent most of his time at his desk writing. This desk was at one end of the room on a raised platform, access to which was by a flight of steps at each end. Every now and again these steps and part of the platform would be inconveniently filled with boys 'sent out' by the monitors to be punished. Then the master would arise like a giant refreshed with wine, and smite his boys on the hinder part or on the hand, and so clear the platform. The subjects taken by the monitors in the classes were reading, spelling, arithmetic, grammar, and geography. The two last were taught musically. We chanted all our facts, and were very conservative—not hasty to change. Russia had conquered Poland, and obliterated it, with its capital, from the map of Europe. Yet we cared for none of these things, but continued to sing : 'Warsaw

on the river Vistula capital of Poland.' This we did by the quarter-of-an-hour at a time, and to the following chant :—

| r : r | r.r : r.r | r.m : f | m.m : m.r | d : d |
War-saw on the river Vistula capital of Po-land.
(Repeat *ad lib.*

As each of about twenty classes was chanting a different fact, the din developed into a powerful crescendo, and necessitated the frequent use of the general monitor's whistle, and the remark that we were making 'too much noise' and must 'go on' quieter.

For 'writing' on slates or in copy-books we 'changed' into the desks, and were then under the entire charge of the general-monitor. The slates were screwed on the desks, and the 'copy' was written on a large, long blackboard, slung up and suspended from one of the beams of the roof. The same copy did service for a month or so. One favourite sentence was 'Fear God and Honour the King.' Of course, there was no king at this time ; but that, like the annihilation of Poland, was a mere detail. While the rest of the school was thus engaged, the master 'took' the monitors.

It may, perhaps, be asked, 'Where was the special virtue in all this, the loss of which is to be deplored ?' Well, it was just this. Every boy felt that *he* was a part of the vast whole. That the school was, in fact, just what he contributed to make it. The boys did everything. They swept and dusted the room ; they cleaned the blackboards, inkwells, and windows ; they reported any boy coming with dirty boots ; they gave out and collected the materials ; they would not think of giving out a reading-book to a boy who had dirty hands ; they soundly thrashed any big boy found ill-treating a little one ; they made it a rule to 'pelt' all cheats and sneaks ; and they turned out of the playground anyone using bad language. Now, I have no hesitation in affirming that although there was nothing like the good, sound instruction of the modern school to be found in this old *régime*, yet there was a good deal of 'man-forming' in it ; *that* was its *virtue*. Hence, in the general management of boys, it is well to bear in mind that they should be allowed to do as much as possible themselves, and for themselves.

There is another well-marked feature in a boy's nature : the gratification he feels in knowing that he is trusted ; and that, finding his teacher credits him with good conduct, he must be on his guard, lest he lose the confidence reposed in him. The lad at Rugby who said, 'it is a shame to tell Dr. Arnold a lie, for he always believes us,' was but indicating an almost universal characteristic of boyhood.

Again, a child is singularly sensitive to sarcasm, and feels the sting of it very bitterly. I speak from experience ; for one of my teachers employed that weapon towards me most cruelly. An educator should but very seldom resort to sarcasm. It is extremely unfair, because the boy is not allowed to retort. He has to sit silent and bear the thorn tearing at his heart ; he has to endure the outrageous turmoil of the legion of devils raging in his breast, all ready to break out and rend him and his tormentor. Does the teacher not see that by the unsparing use of sarcasm he is calling into activity, and so developing the passions of hatred, malice, and revenge ? What chance had my teacher of truly educating me, when the only feelings I had towards him were those of absolute hatred ?

Now, the whole nature of a boy is most truly indicated in the playground. It is when my five or six hundred boys are tearing about in unbounded glee here, that I walk among them, and find all the varied attributes and characteristics of boyhood, absolutely naked before me. I am not going, at present, to describe all these, for I may, at some future time, present the subject, in a somewhat detailed form, under the title, 'The Ethics of the Playground.'

—o—

NEW DICTATION TESTS.

Suitable for 'Unseen Tests' in Reading also.

STANDARD IV.

No. 97.

The captain of the ship was a remarkably strong well-built man, about five feet seven inches high, his limbs particularly well formed, with a fine ankle and a very small foot, of which he seemed very vain, as he always wore, while on board ship, silk stockings and shoes. His hands were also very small, and had the plumpness of a woman's rather than the robustness of a man's. His eyes were light grey, his teeth good, and when he smiled, the expression of his countenance was highly pleasing.

No. 98.

A little way up Fleet Street you pass the splendid offices of a great daily newspaper. If you could look in there in the middle of the night you would see a wonderful sight. The telegraph machines are clicking away ; reporters are busy writing out the notes that they have taken at important meetings ; messages keep arriving from every part of the world ; in the printing office, men are putting all this matter into type ; the editor and his assistants are busy composing articles of their own, and altering those of others so that they will suit the paper. A little later, the great machines begin to thunder away, turning out printed copies like the one you see on your breakfast table.

No. 99.

Iron filings, sand, and Chinese clay are much used in mixing with tea. These foreign substances make the tea weigh heavier, and it is hard for any one not an expert in teas to discover their presence. The Chinamen are adepts at this business of adulteration. In the case of the iron filings they are scattered over the leaves while they are green, and as the leaves curl up and dry, they cover this foreign substance from sight.

No. 100.

It is well known that horses can hear deep sounds which men cannot. For days previous to the earthquake in Italy, the horses there showed every symptom of abject fear, which continued without any change of character till the fury of the convulsion broke forth. But not till a few seconds before the earth began to quake did human beings hear any sounds, while it is extremely probable that the horses heard the noises during the two preceding days.

No. 101.

The public appearances of the Prince of Wales are hailed with delight in all quarters ; whether it be laying the foundation-stone of a hospital, or the opening of a museum, presiding at an official banquet, or formally opening a bridge to the public, or a visit to a large manufacturing town to inaugurate some new scheme for the improvement of the people generally—all classes, rich and poor alike, vie to do him honour.

No. 102.

At a meeting of gas engineers, an expert referred to the number of fires caused by rats and mice, and exhibited a piece of gas-pipe bitten through by rats in two places, one of the holes being as large as a nut. In this case, the escape of gas was fortunately noted in time, and a serious explosion was thereby averted. Many fires are also, it is said, caused by rats and mice igniting matches by gnawing the end.

No. 103.

Baskets, both chip and wicker, are very cheap, and nothing can be better than such for grape or tomato packing. In packing, let the aim be to present at least one side and the top in a perfect condition. Wadding or wool is a very necessary item, but must not be used, as is too often the case, to put the grapes in—a very mistaken idea. Line the basket with a sheet or piece of newspaper, then cover the paper with a thin piece of wadding, covering this again with a piece of glazed cap or tea paper.

No. 104.

The Prince of Wales said:—It gives us much satisfaction to come here to-day; and although the glance I have had in going through this building has been a cursory one, still it has shown me how wonderfully well the building has been constructed, and how useful all the departments must be. I have little doubt it will be a thorough success, and most heartily do I wish it to be so. I have only now to declare that the Goldsmiths' Company's Institution is now open.

No. 105.

Five of the pearl divers go down at a time; when they come up, the remaining five descend. Their method of diving is very simple. The men, having removed almost all their clothing, place their feet upon a large stone to which a rope is fastened; with their right hand they grasp the rope above, and with their left they close their nostrils. They are now ready. The signal is given, and by the assistance of the stone they soon reach the bottom. Quickly gathering all the shells within reach, they place them in a net which is hung round their neck, give the signal to their comrades in the boat by pulling the rope, and in less than half a minute they are hoisted up with their precious burden.

No. 106.

All great leaders and rulers, in whatever line or profession, gain their chief honour and renown not so much from their own comparatively few grand and noble deeds, as from the many good actions, smaller in themselves than their own, but infinitely more numerous, which they influence their fellows to perform. I mean, that a truly great leader always shows forth the greatness of those whom he rules and leads, rather than his own greatness; *he* shines in *them*.

No. 107.

In some mountainous countries, the goat leads long strings of animals daily to and from the mountains, but it is in South Africa that it is regularly employed as a leader of flocks of sheep. Should a blinding storm drive the silly sheep before it, or cause them to huddle together so as to suffocate each other, the trained goat will wake them up, and, by a method best known to himself, will induce them to follow him to a place of safety.

No. 108.

From spring to autumn, to the very verge of winter, the forest yields delight, amusement, and instruction to multitudes of people. Each season has its own special objects of interest and its own peculiar charms. Spring offers opening buds, and there is a nice chance for marking the time when each tree puts forth these proofs of life. The leaves, as spring advances, show virgin tints of many hues, and the woods are beginning to be vocal with the songs of birds and the chirpings of insects.

No. 109.

The soil of Ireland is very productive, but the farms are so small, and the state of agriculture so backward, that the Irish people are generally very poor. With the exception of some districts in the north, where the farms are larger and better cultivated, the small patches of land are scarcely sufficient to supply food for the tenants and their families, and at the same time enable them to pay their rents. The result is that during bad seasons there are often periods of great scarcity.

No. 110.

There are numerous specimens in the British Museum of the knives used by the natives of Australia in years long ago. They are made of thin pieces of stone not more than two or three inches long. In course of time, however, man discovered bronze, and from that moment implements and utensils made of this metal took the place of the stone ones. In order to manufacture the various articles that were required, moulds had first to be made in the sand, and then the metal, having been already melted, was poured into the moulds and allowed to cool. Knives and sword blades were thus made, and in order to harden the edges of the weapons, they were first heated and then cooled suddenly, being afterwards hammered.

No. 111.

When the late Bishop of Carlisle was once preaching in aid of the hospitals in Westminster Abbey, he upset a glass of water placed for him on the pulpit before he had begun to speak. The water trickled down the neck of an unfortunate young man sitting below, and the Bishop, who was quite unconscious of the mishap, commenced his sermon, strange to say, with the words 'Accidents will happen.'

No. 112.

It is the men of letters and the men of science, the men who write and the men who act, that make the opinions which the people at large fancy are theirs, and who in the end are the law-makers. The painter appeals more forcibly to the eye than the politician, and in the privacy of his own room the author's sentences sink far more deeply into the reader's mind than the words of the mob orator in the street.

No. 113.

Children need no longer be disfigured by ears which stand out like unmeaning screens at each side of the head. An ear cap has been invented which is no more than a light skeleton of tapes and elastic. These converge over the ear, and effectually hold it in its place close to the head. The cap is intended to be worn at night, and, as it is tied under the chin, the little wearer cannot sleep with his or her mouth open, and the uncomfortable habit of snoring is checked at the same time.

STANDARDS V.—VII.

No. 82.

No word, no thought in Matthew Arnold was unworthy of the austere religious beauty of the great Abbey in which for centuries his countenance would be enshrined, and where his memory would enjoy such immortality as was possible on earth. Envy, jealousy, meanness, were unknown to him; they withered in his presence. His writings were but the revelation of himself—now playful, now serious, always aiming at making the world better and mankind happier. 'And now to unveil his likeness, and to leave him amongst the graves and monuments of England's greatest men in this magnificent church; and let this be a nobler tribute to Matthew Arnold than his oldest friend has been able to render.'

No. 83.

During the winter the place was bleak and lonely, but in summer the beauty of the surrounding scenery rendered it quite attractive. A wealthy manufacturer had purchased its only curiosity, an old rambling, dilapidated stone house, to which a few ghostly legends were attached, and fitted it up in almost royal magnificence. The overgrown shrubbery was trimmed, the walks cleared, the sloping bank shorn close and transformed into a velvety lawn. The old broken windows were replaced with casements, the ragged stone steps gave place to a broad balcony, over which were trained choice plants that scented the air with fragrance. Not a point of exterior beauty was overlooked. Large greenhouses were built and filled with rare flowers, and luscious fruits ripened before their time by the assistance of art.

No. 84.

There are few parents who have not at times felt a tremor as to what, under certain not improbable occurrences, might be the fate of their children. Life is so uncertain, not only as to its duration, but as to its conditions, that even the affluent do at times feel apprehensive of poverty, while those in moderate circumstances are for ever liable to misfortune. A home where, at the worst, our children will receive almost parental care, and a training superior to that which we might ourselves bestow, is an institution we must all feel thankful for, and which it is the duty of all to foster.

No. 85.

In Russia the state of affairs in the afflicted provinces is described as 'heart-breaking and hopeless,' inasmuch as the surviving officials, governmental and municipal, are paralysed with terror and grief, so much so, as to be incapable of making any adequate effort to provide relief for the innumerable wounded, homeless, and starving sufferers who look to them for aid. Such steps as they have attempted to take in that direction have been woefully hampered by the utter annihilation of over seventy miles of railway—a crowning mishap, which has, for the time being, interrupted communications between the suffering districts and the rest of the Empire.

No. 86.

Far off, high above everything, the golden cross of St Paul's glowed like a shape of sacrificial hope. The one forsaken elm that

tried to thrive in the little grass plot at the corner of the street was quivering in the light breeze as if with the joy of recovered life, glad to find its fibres no longer vibrating with the roar of wheels, dreaming, almost, that it was back again in that wide forest, where the dew flashed, and the birds sang, and its brief sapling youth was spent. And in its smoky branches the sparrows chirped, and a ragged starling smoothed his feathers, and talked loudly to himself about the evil ways of men and the blessedness of dawn.

No. 87.

Those who have arrived at the 'Age of Wisdom' will better appreciate the Victorian Exhibition than those who have not. Here, so to speak, they have a panorama of their life, a record of the world's doings, a picture of its events from as long as they can recollect almost up to the present moment. They have no idea how vast is their experience, how much they have gone through, or how many great people have lived in their time, till they go quietly round those galleries and polish up their memory with the countless pegs they here find on which to hang their recollections.

No. 88.

A loose practice has long been in vogue of addressing and using the title of 'Doctor' without regard to qualifications. It is for the interests both of the public and the profession, that a rigid etiquette should be preserved in these matters. The careless use of the title of doctor by practitioners who have not graduated in a university, facilitates the proceedings of unqualified men. As regards foreign qualifications, again, it cannot be too sturdily maintained that these are of no recognised value in this country. It is notorious that many foreign universities are shamefully lax in granting degrees, and that these often afford no criterion whatever.

No. 89.

On the outbreak of the earthquake thousands of the gentle, industrious, kindly Japanese were crushed to death in an instant. What had been thriving settlements, peopled by busy, cheerful folk, living simple, useful lives, unmenaced by any ills other than those which flesh is heir to, were transformed into mere heaps of inanimate débris, marking the fatal passage of the merciless earth-wave. An enormous area of highly-cultivated country, dotted with prosperous towns and thriving villages, was of a sudden smitten by such havoc and devastation as had never before been witnessed.

No. 90.

There was no form of education so valuable as that which was open to a boy living in a cultivated home, and enjoying at the same time the advantages of a public school—that was to say, enjoying the intellectual good of their homes, and growing up in the association of the school, sharing in its love of discipline, and imbibing its public spirit. There was a certain preparation and training for citizenship which it was very difficult to obtain in any other way than in the great public schools, and in offering these facilities they might make it worth while to a great many parents who could not afford the expenses of boarding schools to let their sons have the advantage of growing up members of an old public school.

No. 91.

One-pound notes continue to be talked of almost to the exclusion of every other subject. In brief, it appears that bankers are against the scheme, and that the Stock Exchange favours it. Bankers tolerate it, however, because they have the prospect of getting rid of their light gold coin without loss, and some of the banks are heavily loaded with this undesirable currency. Cashiers and chief clerks, however, oppose the scheme, because small notes would be very troublesome. They do not see how they can take the numbers of notes; it will be useless weighing them as sovereigns are weighed for example, and counting would be tedious as well as unsafe, seeing that a chief protection against forgery of larger notes is the registering of numbers.

No. 92.

The Free Education Act is being almost universally applied in the towns and villages throughout East Kent, and, from the steps already taken, promises to be the means of inculcating the principles of thrift quite as much as of promoting education. In nearly every case in which the Act has been adopted, the school managers have established savings banks and clothing clubs, to which the parents have been invited to contribute the pence hitherto paid for the children's schooling. In the great majority of cases the parents have responded to the suggestion.

No. 93.

Coffee-tea was brought under the notice of the Royal Botanic Society of London on Saturday. The samples of coffee-tea, or prepared coffee leaves, were grown in the society's conservatory. The secretary said, 'that as the leaves may be easily grown in many parts of the world where it is difficult to insure good crops of coffee beans, he thought it might prove a valuable agricultural product in many of our warmer colonies. At present, only some two millions of men use coffee-tea in comparison with one hundred and ten millions who use the bean, and five hundred millions who drink Chinese and Indian tea.'

No. 94.

A tradesman, who has been fined for selling adulterated pepper, has certainly reason to regard his case as a hard one. This respectable grocer had purchased the commodity of a wholesale firm of credit and renown. He had, moreover, paid the full price of genuine pepper, and had received with it an invoice from the wholesale house certifying that the pepper sent out by them was 'ground at their own mills under their own supervision, and guaranteed as genuine.' For all that, the article having been tested by an official analyst was discovered to be adulterated with ground rice to the extent of 15 per cent.

No. 95.

Many improvements in the mechanism of the Cliff Railway at Lynton have just been completed. Two complete sets of new machinery and cars have been supplied, and as it was frequently found last season that the accommodation afforded was not sufficient to meet the requirements, larger and handsomely fitted cars have now been provided. By means of a new brake arrangement, a regular speed is maintained throughout the journey, while the cars are stopped slowly and smoothly at the platforms. The whole of the regulating mechanism is highly ingenious and thoroughly successful. The railway, which is one of 'the sights' of North Devon, is now in perfect working order.

No. 96.

Yesterday morning, an extraordinary gas explosion occurred at Glasgow, the street being blown up, and six men, including two constables, seriously hurt. It appears that the foreman, who was supervising some work which was being carried out on the new underground railway, heard a rush of water, and went with a naphtha lamp to ascertain the cause. Instantly, there was a tremendous explosion, the street sank, and huge flames shot forth. The fire brigade was at once summoned, and it was ascertained that six men had sustained injuries.

No. 97.

Arnold was always the same. The dutiful son grew into the loving father; the affections of his youth strengthened and deepened into the husband's steadfast love; the clever, original, and wayward student and scholar became, without any external change, the penetrating and strong yet subtle critic; the refined, the pathetic, philosophic, the *great* poet. Much had been said elsewhere of his uneventful yet most interesting life, of the gradual fashion in which he overcame the sneers and prejudices of men whose words have long since ceased to influence the opinion of men of cultivated, reflecting, and independent minds, who think for themselves, and who determine in the last resort and without appeal, the permanent place of an author in the goodly fellowship of his equals or superiors.

NEW COMPOSITION STORIES.—STANDARD V.

Suitable for 'Unseen Tests' in Reading also.

No. 122.

How he Checked his Temper.—The following anecdote shows the simple method used by a gentleman to control his temper. A French statesman received a visit one day from a friend who, on sending up his name, was shown into the gentleman's private room. A warm discussion arose between them. Suddenly a servant entered and handed the Minister a note. On opening it he at once changed his tone of voice, and assumed a very quiet manner. Puzzled at the contents of the note and the marked effect it had suddenly produced, his friend cast a furtive glance at it, when, to his astonishment, he perceived that it was simply a plain sheet of paper, without a mark upon it! More puzzled than ever, the gentleman, after a few minutes, took his leave, and proceeded to interrogate the servant, to whom he was well known. 'You have,' said he, 'just handed to the Minister a note, folded up, which had a most extraordinary effect upon him. Now, it was a plain sheet of paper, with nothing written upon it. What did it mean?' 'Sir,' replied the servant, 'here is the explanation, which I must beg you to keep secret, for I

do not wish to compromise myself. My master is very liable to lose his temper. As he himself is aware of his weakness, he has ordered me, each time that his voice is raised sufficiently to be audible in the ante-room, without delay, to place a sheet of paper in an envelope and take it to him. That reminds him that his temper is getting the better of him, and he at once calms himself. Just now I heard his voice rising, and immediately carried out my instructions.'

No. 123.

TRAPS FOR MONKEYS.—The natives of the country near the Panama Railway catch monkeys by means of a trap so simple that it is strange that it succeeds with so cunning a creature. A hole, large enough to admit a monkey's hand, having been cut in a cocoa-nut, the inside is scooped out, and a piece of sugar put in. A string is next fastened to the nut, which is placed upon the ground, and then the natives hide themselves in the bushes, one of them keeping hold of the other end of the string. Soon a troop of monkeys come along. A sharp-eyed one, full of curiosity, spies the nut, drops down from the tree, and pushes his paw into the hole for the sugar. Of course, he cannot withdraw his paw with the sugar in it, and he is too greedy to open his hand and give it up. By-and-bye the nut is quietly drawn towards the bushes, all the monkeys scampering after it. When they have come near enough for the purpose, a net is neatly thrown over them, and usually twenty or thirty of them are captured.

No. 124.

HOW A BANK LOST £30,000.—A director of a certain bank had occasion for £30,000, which he was to pay as the price of an estate he had just bought. To facilitate the matter, he carried the sum with him to the bank, and obtained for it a bank-note. On his return home he was suddenly called out on very particular business. He threw the note carelessly on the mantel-shelf; but when he came back a few moments afterwards to lock it up, it was not to be found. No one had entered the room; he could not, therefore, suspect anyone. At last, after much ineffectual search, he was persuaded that it had fallen into the fire. The director went to acquaint his colleagues with his misfortune, and, as he was known to be an honourable man, he was readily believed. He received a second note upon giving an obligation to restore the first if it were found, or to pay the money himself if it should be presented by a stranger. About thirty years afterwards (the director having been long dead) a person presented the note at the bank, and demanded payment. It was in vain that the cashier mentioned the transaction by which that note was cancelled; he would not listen to it. He maintained that it came from abroad, and insisted on its immediate payment. The note was payable to bearer, and the £30,000 was paid to him. The heirs of the director would not listen to any demands of restitution, and the bank was obliged to sustain the loss. It was discovered afterwards that an architect, having purchased the director's house and taken it down in order to build another, had found the note in a crevice of the chimney, and made his discovery a means for robbing the bank.

No. 125.

WHY BANK-NOTES ARE ALWAYS CLEAN.—You rarely see a soiled Bank of England note. They are nearly always white, new, and crisp, for the reason that a note is never issued from the Bank a second time. When they find their way into the Bank, new notes of the same number, and the same denomination, of course, are issued in their stead. They are made from new white linen cuttings, never from anything that has been worn. So carefully is the paper prepared, that even the number of dips into the pulp made by each workman is registered on a dial by machinery, and the sheets are counted and booked to each person through whose hands they pass. They are made at Laverstoke, in Hampshire, by a family named Portal, and have been made by the same family for more than one hundred and fifty years. They are printed within the building, there being elaborate arrangements for making them, so that each note of the same denomination shall differ in some particular from the other.

No. 126.

A DOG PATIENT AT ST. THOMAS'S HOSPITAL.—A short time ago a four-footed patient was brought to St. Thomas's Hospital. He was a collie dog named Mac, and his mistress related that while out walking he had been attacked by another dog, and during the fight was run over by a brougham. Examination showed that one fore-leg was badly fractured, and the other bruised, whereupon chloroform was administered and the broken limb encased in plaster of Paris splinters. On Saturday, the splints were removed, and the dog was discharged cured. The patient was entered on the books as Mac:—occupation?—pugilist.

No. 127.

NOVEL CAPTURE OF A BURGLAR.—Frequent burglaries alarmed the residents of a Japanese village, but no clue whatever could be obtained regarding the perpetrator. An ingenious fellow, whose home had been plundered, proposed that each villager should write down the name of the man he suspected on a slip of paper and put it in a ballot box. On the votes being examined, it was discovered that fifteen named one man, and the rest were blanks. The robber was so astonished at the result of the balloting that he actually confessed his identity.

No. 128.

THE DUKE OF YORK AND THE OFFICER.—The Duke of York once remarked to an officer at the mess of the 11th Regiment that he was uncommonly bald, and although a younger man than His Royal Highness, he stood more in need of a wig. The officer who had been of very long standing in the service, and whose promotion had been by no means rapid, informed His Royal Highness that this baldness could be easily accounted for. 'In what manner?' asked His Royal Highness eagerly, to which the officer replied, 'By junior officers stepping over my head.' The Duke was so pleased with the reply, that the gallant officer obtained promotion in a few days afterwards.

No. 129.

A TRAVELLING NEST.—At a German railway station, a little wagtail built her nest in a goods waggon. This waggon made from six to eight journeys a day, but the bird was in no way troubled thereby, and hatched her young ones just as though she had been in a quiet and retired spot, instead of amidst all the noise and bustle of railway travelling. During every journey she remained with her young ones, but at the end of each she left the waggon, and obtained food for her young.

No. 130.

THE PRAYER OF THE SAILOR.—When the British ships under Lord Nelson were bearing down to attack the combined fleet off Trafalgar, the first lieutenant of the *Revenge*, on going round to see that all hands were at quarters, observed one of the men devoutly kneeling at the side of his gun. So very unusual an attitude in a British sailor exciting his surprise and curiosity, he went and asked the man if he was afraid. 'Afraid!' answered the honest tar, 'No! I was only praying that the enemy's shot may be distributed in the same proportion as prize money is—the greatest part among the officers.'

No. 131.

THE BISHOP AND THE BUSHMAN.—During the ten years he was in Australia, Dr. Moorhouse, the present Bishop of Manchester, made himself very popular through his geniality, tolerance, and common sense. One night the Bishop was about to lecture in a little township perched on the Australian Alps. The hall was packed, but a young bushman attired in a striped shirt and moleskin trousers, and wearing a flaming red comforter, was determined to push his way to the front. He thought he saw a vacant seat on the platform and made for it. 'Would you mind shoving up a bit, missus?' he said to a quiet homely-looking lady. 'No, no! you musn't sit there,' interposed the local clergyman, 'that's the Bishop's wife.' 'Nonsense!' exclaimed the Bishop, who had overheard the remark. 'Squeeze up a bit, Mary.' Mrs. Moorhouse laughingly did so, and the young bushman sat by the side of the Bishop's wife throughout the lecture.

No. 132.

THE RESULTS OF ENTHUSIASM.—When Spenser had finished his famous poem of the 'Fairy Queen,' he carried it to the Earl of Southampton, the great patron of the poets of the day. The manuscript being sent up to the earl, he read a few pages, and then ordered his servant to give the writer £20. Reading on, he cried in rapture, 'Give him £20 more!' Proceeding farther, he exclaimed, 'Give him another £20!' But at length he lost all patience, and said, 'Go, turn that fellow out of the house, for if I read farther, I shall be ruined!'

No. 133.

TOO MANY DOGS SPOIL THE COAT.—The instinct of Newfoundland dogs to save a drowning person has been somewhat painfully tested by an unlucky Frenchman. He was walking in the country with a friend who possessed a magnificent Newfoundland, and incautiously questioned the truth of the animal's sagacity. The dog's master, vexed at the slur cast upon his favourite, gave his friend a push and knocked him into a shallow river. Turk immediately sprang in, and seizing one of the tails of the immersed man's coat, commenced to swim for land. Unfortunately, another

Newfoundland dog, trotting along on the other side of the river, saw the affair, and also came to the rescue. Dog No. 2 immediately seized the other tail of the coat, and wished to swim back to his master. Turk held fast and struggled for his side, and the owner of the coat cried in vain for help. At last the coat gave way, and each dog swam proudly home with a piece of cloth in his mouth, so that Turk's master was forced to plunge in himself to save his friend.

No. 134.

THE LADY AND THE DOCTOR.—A lady was very solicitous about her health. Every trifle made her uneasy, and the doctor was called immediately. He was a skilful man, and consequently had a large practice. It was very disagreeable to him to be so often called away from his other cases for nothing, and he resolved to take an opportunity of letting the lady see this. One day the lady observed a red spot on her hand, and at once sent for the doctor. He came, looked at her hand, and said, 'You did well to send for me early.' The lady looked alarmed, and asked, 'Is it dangerous, then?' 'Certainly not, madam,' replied the doctor. 'To-morrow the spot would have disappeared, and I should have lost my fee for this visit.'

No. 135.

THE FAITHFUL DOG.—A poor woman returning from a market town at some distance from her home was overtaken by a severe snowstorm. She carried a basket of provisions which she had bought in the market, and was accompanied by her dog. The cold overcame her and she fell down benumbed. Her faithful dog ran to the village where she lived, whining piteously. He pulled at the clothes of everyone he met, and endeavoured to induce them to follow him to his poor mistress. No one, however, understood his signs, and as he could get no help from her neighbours, he determined to go back and do what he could himself to assist her. Three days afterwards he was found lying beside the corpse of his mistress, almost dead with cold and hunger, with the basket of food by his side untouched.

No. 136.

A CLEVER MONKEY DETECTIVE.—A monkey detective recently brought a man to justice at Singapore. A native, with a little boy, a bear, and a monkey, travelled lately through several villages, and made a good sum of money by his animals' tricks. One day he was found with his throat cut, the boy and the bear lying dead close by, while the monkey had escaped up a tree. The bodies, with the monkey, were being taken to the police station when the monkey suddenly rushed at a man in the crowd, seized his leg, and would not let him go. The man seemed so alarmed and anxious to get away, that the police became suspicious, and searched him, with the result of finding part of the money belonging to the murdered native. The remainder was discovered at his house.

No. 137.

THE INTREPID BOY.—Two boys adventured to capture a jackdaw's nest from a crevice under the belfry window. It was impossible to achieve their object while standing within the building, and equally out of the question to reach the nest from below. So the plan adopted by the boys was to put a plank through the window. The bigger boy balanced it by sitting on the end within, and the lighter lad fixed himself on the outside end. From that dangerous position he reached the nest. He found in it five fledged young birds, and announced the news to his comrade. 'Five are there?' replied he; 'then I'll have three!' 'Three!' exclaimed the other indignantly; 'no, I ran all the danger, and I will have the three.' 'You shall not,' replied the voice from the interior. 'Promise me three, or I'll drop you.' 'Drop me and welcome,' replied the intrepid youth, perched on the trembling piece of wood. Strange to relate, the boy alighted on the ground more than a hundred feet below, unharmed. He was holding his prize by the legs, two in one hand and three in the other, and the birds, finding themselves descending, instinctively fluttered out their pinions. But it was not these alone that saved the boy. He had on a stout new carter's frock, secured round the neck, and this filling with air from beneath, buoyed him up like a balloon, and he descended smoothly to the ground, alighting like a cat on his legs, and then looking up, he exclaimed to his companion, 'Now you shall have none!' and ran away, sound in limb, to the astonishment of the inhabitants, who, with inconceivable horror, had witnessed his descent.

No. 138.

THE RATS AND THE CAPTAIN'S BISCUIT.—When the stock of biscuit on board ship begins to disappear in a mysterious way, it will not be rash to suspect that rats have something to do with the case. This happened not long since on a vessel, and as the biscuit was of that kind known as Captains', which is of a large size and very hard, it was difficult to bring the theft home to the rats. One night, however, a sailor lying in his bunk witnessed a number of the animals in the very act of robbery, and a most ingenious plan they adopted to get at the biscuits, which were kept pretty closely packed in a wooden box. Two rats were seen to climb up on to the top of one of the sides. They were accompanied by several mates, who stood on the shelf on which the box lay. Presently, the two rats were seen to bend downwards towards the biscuits, and at the same time the tail of the nearer one was seized by the rats on the shelf. Speedily the two former were struggling with a biscuit, and as soon as they had obtained a firm grip of it, the rats below hung on to the tail as hard as they could. It was 'pull rats, pull biscuit.' The tug of war always ended in favour of the rats.

No. 139.

A STORY OF A BULL-DOG.—A certain gentleman has a grand specimen of a bull-dog which he has taught several tricks. One of these is very amusing. When he is in town he will stroll with a friend down a quiet street, and will say to his dog, 'Now, Gripper, lie down there and don't let anyone touch this,' and immediately before the dog on the pavement he will put down a half-crown. Then he will stroll carelessly away, and, affecting to be talking in a casual sort of way to his friend, will await results. Presently, a passer-by stops at the sight of the coin, and scarcely marks the dog, which, with his eyes closed, appears to take no notice of anything. But just as the acquisitive one reaches for the coin, the dog gives a deep and ominous growl, and shows his teeth. A very rapid withdrawal of the extended hand is the result. Other passers-by of course gather there (that may be taken for granted), but whenever any attempt is made to pick up the coin, the result is the same; the dog looks so fearfully and wonderfully vicious with his fangs exposed, that no one dare go near the half-crown. Just at this time, up strolls the owner of the dog with his friend. 'Hallo,' says he, pushing through the crowd, 'what's this? A half-crown on the pavement; why don't you pick it up?' 'Keep off, master,' says someone in the crowd, 'or the beast there will tear ye to pieces.' 'Not a bit of it,' is the reply, as the gentleman very calmly stoops down, picks up the coin, and walks off, the dog not following for a moment or two, but, as though he appeared to enjoy the joke, blinking his eyes and seeming to be thoroughly content.

No. 140.

HOW RUBENS PAID A BILL.—In the beginning of the seventeenth century Peter Paul Rubens, the great painter, lived in Paris at a modest inn. Sometimes he had his pockets full of money and lived like a prince, but oftener he was without a penny. The host did not consider it an honour to board this great painter, and often cast insults at him. One day when the innkeeper was in an especially bad humour, he threatened to throw him out of doors, when Rubens gave his word of honour that he would pay his debts within eight days. With these words he hurried upstairs and locked the door. He left the room very seldom, and never without taking the key with him. A week later he appeared before his host and said, 'I have kept my promise. Upon the table in my room you will find more money than I owe you. Farewell, sir host.' Then he left the inhospitable house. The tavern-keeper hurried upstairs to the artist's room. The door stood open, and the mass of money which was spread upon the table met his gaze. It lay there in gay confusion. Naturally the good man thought he must quickly put his money in a safe place, but what was his astonishment and fury when, upon touching one of the coins, he found that it was only painted! But his anger lessened somewhat when he saw on the walls the rich clothing that had been left by the painter. From the sale of this he could cover a great part of the debt. He reached for a cherry-coloured velvet mantle—what disappointment! That, too, like the other garments and the glittering gold, was only painted! The unhappy host was pitied by all his friends who heard it. The story became known, and the painter's fame grew and spread. Distinguished people streamed to the modest tavern to hear of Ruben's gay trick, and see the painted clothing, and many a franc was spent in the tavern for the purpose of seeing these things.

No. 141.

A NOBLE SACRIFICE.—During the last war in Afghanistan a young officer, with a small body of soldiers, was sent upon some mission a short distance from the English camp. As they were returning, riding gaily along a narrow mountain gorge, they suddenly perceived a troop of Afghans galloping headlong down after them. Being greatly outnumbered, the best chance of safety for the little band of English soldiers lay in flight, and they soon began to distance their pursuers. All at once a shot from an Afghan rifle struck one of the soldiers' horses, which staggered a few paces and then fell, crushing his rider. In an instant, while the others swept

on, the young officer had drawn rein, flung himself from the saddle, and dragged the fallen man to his feet. 'Quick! my horse will carry two,' he cried. But alas! the horse, finding himself free, and terrified perhaps, by the shouts of the Afghans, had galloped after his retreating comrades. One minute more, and the noble young officer and the man he had vainly tried to save were lying lifeless, pierced by the long knives of their merciless foes.

—o—

STANDARD PROBLEMS.—STEP BY STEP.

With Blackboard Examples.

BY JOHN PENDLEBURY.

STANDARD VI.

As the code informs us, the real arithmetical work for Standard VI. consists of the solution of sums involving 'fractions (vulgar and decimal), simple proportion, and simple interest.' These will have been thoroughly explained and mastered before commencing with problems, and as the majority of the problems will involve one or other of the foregoing rules, it is very important that they should be thoroughly overhauled in every detail. But that is without the real province of these papers, and, as usual, we shall leave that to the previous work of the teacher, and will regard it as having been well taught, and forming an excellent foundation on which to build, and arrive at correct solutions to the problems. As a rule, the problems set in Standard VI. are not really difficult, at least, not more so comparatively than in the other standards. It matters very little also what problem we begin with, provided that we precede each by suitable progressive mental exercises, as explained and illustrated so often in the work for the preceding standards. (1) If A starts on a journey and goes 128 miles a day, how long will it take B to overtake A if B starts 3 days after, and walks 152 miles a day? Commence by asking the following mental exercises:—Suppose one boy walks four miles a day, how far will he have gone in 3 days? $4 \times 3 = 12$ miles. Now another boy begins to walk at the rate of six miles a day. Will he always be behind the first boy? No. Why? Because he gains 2 miles $(6 - 4)$ on him every day. Well, now, if he gains 2 miles on him every day, and the first had got 12 miles start, how long will he be before the latter overtakes the former? $12 \div 2 = 6$ days. Multiply these mental tests, which are excellent for training the reasoning and logical faculties, at your own discretion, according to the needs of the dullest students. Now proceed to No. (1), thus:—How far has A got the start of B? $128 \times 3 = 384$ miles. But when B starts he gains on A every day $(152 - 128) = 24$ miles. Then how long will he be gaining the whole 384? $384 \div 24 = 16$ days. Ans.

Complete the working thus:—

128 miles	152 miles = B
3 days	128 miles = A
384 miles	24 miles = gain of B over A in 1 day.

24)384(16 days. Ans.
24
144
144
...

(2) If 4s. 8½d. were given for 1 bushel of oats and £3 10s. for 1 ton of hay, how many bushels of oats would have to be given for 2½ tons of hay? Proceed thus—(*a*) If 5 apples are worth 4 oranges, how many apples are worth 12 oranges? Children will readily see that 12 is 3 times 4, and therefore 3 times 5 must be the number of apples—that is, 15. (*b*) If oranges are 3 for 2d. and eggs 5 for 6d., how many eggs would you give for 36 oranges? First of all, how many times 3 oranges would you have in 36? $36 \div 3 = 12$. What would their cost be? $2d. \times 12 = 24d. = 2s.$ Now how many sixpences are there in 2s.? $24 \div 6 = 4$. And we get 5 eggs for every sixpence, therefore we should get $4 \times 5 = 20$ eggs. Now in (2) how much do 2½ tons of hay cost at £3 10s. per ton? £3 10s. $\times$ 2½ = £8 15s. Now the question really comes to this—how many times 4s. 8½d. have we in £8 15s.? How must we do that? Reduce both to halfpence and divide. Thus:—

£ s.	£ s. d.	s. d.
3 10 cost of 1 ton	8 15 0	4 8½
2½ tons	20	12
7 10	175 s.	56 d.
1 15	12	2
8 15 cost of 2½ tons	2,100 d.	113 h. p.
	2	
	4,200 h. p.	

113)4,200(37 19/113 tons = Ans.
339
810
791
19

(3) A does a piece of work in 8 days, B in 5 days, and C in 12 days. How long will it take them all working together? This will not present much difficulty after the Standard V. Problems of a similar nature have been recalled to mind. Question children thus:—What part does A do in 1 day? ⅛. What part B? ⅕. What part C? 1/12. What part will all 3 do together in 1 day? 49/120. They have 71/120 parts to do, so they will be 120/49 days = 2 22/49 days = Ans.

$\frac{1}{8} + \frac{1}{5} + \frac{1}{12} = \frac{15 + 24 + 10}{120} = \frac{49}{120}$.

49)120(2 22/49 Ans.
98
22

(4) The sum of £3 12s. 6d. has to be divided between a boy and a girl, the boy receiving half as much again as the girl. Find the girl's share. Question. Divide 8d. between a boy and a girl, giving boy 3 times girl's share. Get the children to see that you really divide the 8d. into 4 parts, out of which the boy takes 3 and the girl 1. Therefore $8d. \div 4 = 2d.$; $2d \times 3 = 6d.$ for boy, and $(8d. - 6d.) = 2d.$ for girl, and 6d. is 3 times 2d. Now in (4) the best plan is to say that the girl takes *one* part, and the boy half as much again, or 1½ parts; or, better still, if we deal with *halves*, the girl takes 2 and the boy three. $2 + 3 = 5$. Divide the £3 12s. 6d. into 5 parts = 14s. 6d. each part. Now girl takes 2 parts = 14s. 6d. $\times$ 2 = 29s. = £1 9s. = Ans. Complete working:—

5)£3 12s. 6d	14s. 6d.
	2
£0 14s. 6d.	£1 9s. 0d. = girl's share.

(5) A gentleman left his fortune to be divided among his 3 children, so that the youngest received a quarter of the whole, the second a third, and the remainder went to the eldest, who received £2,500. Find the total sum left by the father. The youngest took ¼ and second ⅓. What part was gone then? $\frac{1}{4} + \frac{1}{3} = \frac{7}{12}$. Now if 7/12 are gone, there are 5/12 left. Therefore, the third child's share of £2,500 represents 5/12 of the whole. Then 1/12 must be £6,000 = Ans.

$\frac{1}{4} + \frac{1}{3} = \frac{3 + 4}{12} = \frac{7}{12}$. $1 - \frac{7}{12} = \frac{12 - 7}{12} = \frac{5}{12} = £2{,}500$

$\therefore$ £2,500
12
5)30,000
6,000 = total sum.

(6) At 9 o'clock in the morning ⅘ of the children in a school were present, and when 6 more had come it was found that ⅚ were present. How many names were on the registers? This will not present much difficulty after the foregoing. If ⅘ are present *before* the 6 come, and then there are ⅚ present *after* those 6 have arrived, then it must be that these 6 have made the difference between the fractions ⅘ and ⅚. This difference is 1/24. The children will soon realize that 6 must represent this 1/24, and if so, then the whole number of children, that is 24/24, must be 144.

$\frac{7}{8} - \frac{5}{6} = \frac{21 - 20}{24} = \frac{1}{24} = 6$ $\frac{24}{24} = 6 \times 24 = 144 =$ Ans.

As there is a great similarity between all the problems required from Standard VI. children, the foregoing will suffice. We now give a number to be used as typical tests, and upon which, as models, the teacher may multiply his examples. (*a*) In a school of 450 children, ⅓ are infants and ⅖ of the remainder are boys; the rest are girls. How many girls were there? (144.) (*b*) A does a piece of work in

10 days, working 9 hours a day, and B does a piece of work in 12 days, working 8½ hours a day. They earn £6. Find what that is for each. (A = £2 16s. 3d. B = £3 3s. 9d.) (*c*) A man who possessed ·6 of an estate, sold ⅔ of his share for £2,000. What is the value of the whole estate? (£4,444 8s. 10¾d.) (*d*) A person bought a box containing a thousand oranges, at 16 for a shilling, just before a rise in the price of three halfpence a dozen. How much did he save? (10s. 5d.) (*e*) In a boys' school a sum of £11 13s. 4d. had to be raised. One-third paid 1s. each, one-third 1s. 6d. each, and the remainder 1s. 8d. each. How many boys were there? (168.) (*f*) If an English pound be worth 25·25 francs, how many English pounds are 353½ francs worth? (£14.)

—o—

RECENT INSPECTION OF A LANCASHIRE SCHOOL.

FEBRUARY, 1892.

STANDARD I.

Boys divided into (*a*), (*b*) and (*c*) groups.

(*a*) *Transcription* from School Reader.

(*b*) *Reading* from Geographical Readers.

(*c*) *Arithmetic.*—

780	11	415
239	140	408
69	896	
672	473	7
1,760	1,520	

For the fourth sum questions on tables were asked. If answered correctly, counted as sum right.

STANDARD II.

Boys divided into (*a*), (*b*) and (*c*) groups.

(*a*) *Arithmetic.*—

1. 73,426 × 470 = 34,510,220
2. 76,027 ÷ 6 = 12,671 + 1
3. 80,915 × 809 = 65,460,235
4. 83,902 ÷ 5 = 16,780 + 2

Class questioned as a whole on the pence table and in Mental Arithmetic.

(*b*) *Reading.*—From 'Star' Reader. Questions on meanings very searching.

(*c*) *Dictation.*—'Trains stop at places called stations. The passengers who have bought their tickets have to wait for the train which stops at their station. When the train is only a short distance from the station a porter rings a bell. That means that all who wish to go in the train must get ready at once.'

Geography.—What use are mountains? What is a Cape? What are seaports? What is a bay? What is an isthmus? What do the different colours on a map show? Point to the coast line. What is a plain? What is a plain called when raised above the rest of the country? What sort of a country is it near here? Which is the largest watershed in England? What rivers flow from the Pennine Chain? What is the land drained by a river called?

Grammar.—What is the verb in 'I crept along in the darkness?' What are the verbs in 'Crouching I sought to hide me?' Make sentences with 'light' as a verb and noun. Make sentences with 'bark' a noun and 'bark' a verb.

STANDARD III.

Class divided into (*a*) (*b*) and (*c*) groups.

(*a*) *Arithmetic.*—

1. £2,045 10s. 9d. − £376 19s. 11½d. = £1,668 10s. 9½d.
2. 604,276 ÷ 376. = 1607 + 44.
3. £24 0s. 11¼d. + £326 11s. 9½d. + £39 13s. 10d. + £2,244 9s. 6¾d. + £336 16s. 11¼d. = £2,971 13s. 0¾d.
4. A man earns £1 10s., his wife 12s. 6d., his children 16s. 11¼d. If their expenses amount to £2 12s., what will they save in a week? = 7s. 5¼d.
1. 926,087 ÷ 387. = 2,392 + 383.
2. £10,000 19s. 2½d. − £2,001 14s. 6¼d. = £7,999 4s. 8¼d.
3. £9,654 18s. 0½d. + £2 3s. 3¼d + £76,329 0s. 10¾d. + £3 10s. + £111,300 0s. 0¾d. = £197,289 12s. 3¼d.
4. A postman delivers letters 6 days a week (52 weeks in a year). If he walks 15 miles a day, how many miles will he walk in 29 years? (Neglect leap years.) = 135,720.
1. £33,002 0s. 11d. − £901 10s. 11½d. = £32,100 9s. 11½.
2. £1,480 16s. 2d. + 14s. 6¾d. + £37,433 19s. 11½d. + £4,429 18s. 10¼d. + £57,919 10s. = £101,264 19s. 6½d.
3. 201,020 ÷ 487 = 412 + 376.
4. If 9 cottages and a field cost £1,010, and the field alone costs £119, what did each cottage cost? = £99.

Other problems:

1. 365 days make a year. If a man receives 15 letters a day, how many will he receive in 20 years? (Do not count leap year.) = 109,500.

2. A suit of clothes cost £3 5s. 6d. The coat cost £1 6s. 7d., the waistcoat 18s. 9d. Find the cost of trousers. = £1 0s. 2d.

3. Two ships were sailing 8,000 miles. One reached the end of its journey in 20 days and the other 5 days after. How many miles a day did one go more than the other? = 80 miles.

4. Nineteen score of sheep are on one hill and 17 score and 6 on another. How many will have to be put on the second hill so as to leave an equal number of sheep on each hill? = 34.

(*b*) *Reading.*—Taken from school readers. Questions on meanings and subject-matter very close.

(*c*) *Dictation.*—From 'Star' Readers:—

'Sometimes one may be seen to fling itself down so as to catch the lower bough of a tree at a distance. Its weight and force make the branch first bend down and then spring up again to a great height. The monkey is carried up, too, so that it can grasp a higher branch, and thus continue its headlong flight.'

Grammar.—The following piece was written on the board, and parts of speech named:—

'The last melon lay on Harry's stand. A gentleman came up, and placing his hand on it, he said, "What a fine large melon! What do you ask for it, my boy?"'

Questions were then asked on the remainder of the story from reading books.

Specimen questions.—What part of speech is Harry's?

What kind of Noun? Why? What parts of speech are gentleman, fine, large, unsound, customer, stand? Why? Is stand always a Noun? Form sentences containing 'stand' as another part of speech. Is 'up' always an Adverb? Name sentences where it is used as a Preposition.

Geography.—Teacher questioned on South Coast of England and North Wales.

Questions by Inspector.—Highest mountain in Isle of Man. What does 'Snae' mean? What does 'fell' mean? What part of England are we in? Why is Lancashire populous? Are all parts of England populous? What makes one place more populous than another? Ship canal? Questions on Geography of lower Standards.

Mental Arithmetic.—Taken by teacher.

Standard IV.

Boys divided into (*a*), (*b*) and (*c*) groups.

(*a*) *Reading.*—Half heard from School Reader—other half from a magazine.

(*b*) *Dictation.*—Unseen piece :—

'It would be difficult to reckon up the value of the benefits which the invention of the steam engine has brought to this country. There is no branch of industry that does not owe something to it. It has immensely increased our comforts and enjoyments; it has, in short, armed the feeble hand of man with a power to which no limits can be fixed, and completed the dominion of mind over matter.'

(*c*) *Arithmetic.*—Problems :—

1. How much do I gain by buying twenty-four sacks of potatoes at 4d. a bushel, and selling them at 6s. 3d. a sack—(3 bushels = 1 sack)? = £6 6s.

2. I had a sovereign and a penny, and I buy as many pears as I can at $1\frac{3}{4}$d. each. How much had I left? = $\frac{5}{7}$d.

3. The front wheel of a cart is 6 ft. round, and the back wheel is twice this length round. How many times will the back wheel turn round in going five miles? = 2,200.

4. A party of 250 people went a distance of 120 miles at $\frac{3}{4}$d. a mile? What was the total amount of the fares? = £93 15s.

5. The wages of a workman was 4s. 7d. a day; he only received £4 0s. 9d. for twenty days. How many days was he absent? = $2\frac{31}{55}$ days.

6. If a waggon that will hold fifty-six bags of coal weighs 23 tons in the full, and the empty waggon weighs 2 tons 3 cwts., the bags 4 tons 3 cwts., how much coal is there in each bag? = $5\frac{37}{56}$ cwts.

Reduction.—Half-crowns to threepences; guineas to pence; tons to stones; square feet to acres.

Multiplication.—
By 97, 19, 73, 69, 397.

Division.—
By 487, 193, 112.

Grammar.—From 'poetry for recitation.'

Parse :—

'Then bugle's note and cannon's roar the
death-like silence broke,
And with one start, and with one cry, the
royal city woke.'

Geography.—Lakes of Scotland. Vale of Strathmore. Crinan Canal. Occupation of people in East of Scotland. Use of Caledonian Canal. Reason the Clyde is a more important river than the Tay. Battle of Bannockburn. Buildings in Edinburgh. Chief town on Skye and Lewis. Staffa. Iona. Battle of Culloden Moor. Granite quarries of Aberdeen. Meaning of 'Aber' and 'Inver.' Capitals of New Brunswick and British Columbia. Products of British Columbia, Manitoba, Newfoundland, and N. W. Provinces. Reason St. Lawrence is more important river than Mackenzie. Rivers flowing into Hudson Bay. Course of St. Lawrence. Towns on its banks. Capital of Canada. Canadian Pacific Railway. Submarine Telegraph to Trinity Bay. Rocky Mountains.

Mental Arithmetic.—Taken by Teacher.

Music.—

Note Test :—

d r m s d' s l s d t a l t d' r m s f e s f r m s d' d.

Time Test :—

| 1:— | 1:— | 1:1.1 | 1:— | 1: | 1: |
| 1:— | 1:1 ‖

Ear Tests :—

d r m, d' t l, s l s,
r r d, s f r.

Standard V.

Boys divided into (*a*), (*b*) and (*c*) groups.

(*a*) *Reading.*—Half from School Readers and half from Magazine.

(*b*) *Composition.*—'A Good Gamekeeper.'

'A gentleman, who possessed a large estate, engaged a Highlander for his gamekeeper. The man was in the gentleman's service for many years, yet there were never any prosecutions for poaching. The gentleman began to think the gamekeeper was not doing his duty efficiently, so he determined to put the man's vigilance to the test. He disguised himself as a poacher, and went on his estate with a gun. As soon as he fired he was pounced upon by his gamekeeper, who dealt him some severe blows and kicks. The servant ceased this brutal treatment only on finding out he was inflicting it on his own master, who was thoroughly satisfied that the man was doing his duty.

'He could now understand why there were no prosecutions, as no poacher would venture on the estate a second time after receiving such severe treatment.'

(*c*) *Arithmetic :*—

1. If a ship sails 1,200 miles in 8 weeks 5 days, how far will it sail at the same rate in 3 weeks 1 day 21 hours? = 450 miles.

2. A man mixes 13 lbs. of tea at 2s. 3d. per lb. with 26 lbs. at 2s. $4\frac{1}{2}$d. per lb. What does he sell the mixture at per lb.? = 2s. 4d.

3. What must be divided by 76 to equal 29 acres 3 roods 39 poles $19\frac{1}{4}$ square yards?
= 2,279 acres 3 roods 12 poles 11 yards.

4. Bill.

1. How long would it take 45 men to perform a piece of work that 28 men could do in 12 days?
= $7\frac{7}{15}$ days.

2. $\frac{2}{5} - \frac{1}{6} - \frac{3}{10}$. = $\frac{2}{15}$.

3. Find the cost of 1,033 tons 12 cwts. 2 qrs. at 12s. 11d. per ton. = £667 10s. 9⅞d.

4. Find the cost of 249 articles at £3 1s. 9½d. each. = £769 6s. 1½d.

1. If a train can go 1 mile in 8 minutes, how long will it be in going 1 mile 3 furlongs 110 yards? = 11½ minutes.

2. Four boys had a sum of money left to them. John had ⅓, William ⅛, and James ⅜; what fraction of the whole was left for David? = $\frac{5}{24}$.

3. If 65 men can do a piece of work in 25 days 5 hours, how long will it take 39 men to do the work (10 hours = 1 working day)? = 42 days 5 hours.

4. Find the cost of 87 tons 17 cwts. 98 lbs. at £2 6s. 8d. per ton. = £205 1s. 8½d.

Grammar. — Parse, 'From his seat he gazed around.' Questions on formation of Nouns, Verbs, and Adjectives from each other.

Geography. — Productions of Italy. Avalanches. Brindisi. Rome, its buildings and history. Florence. Lakes of Switzerland. Towns in Spain. Where is Kiel? What and where are the Dunes? What is Malta useful for? When it is 12 o'clock here what time is it in 30° E. Long.? What is Latitude? What animal is peculiar to Switzerland? Longest river in Europe: comparisons between Rhone, Rhine, and Volga as to rate of flow, character of scenery, etc.

Mental Arithmetic.—⅔ of £2. Difference between ½ and ⅛. 3 dozen at 3½d. each. 1,000 at 1s. 6d. for 50. 12 times 1s. 11¾d. Interest on £25 for 1 year at 5 per cent.

There were no tots given, and no questions on Metric System.

Standards VI. and VII.

Reading.—Every boy read either from school reader or school newspaper. Poetical extracts were selected from readers. Close questioning on meanings of words.

Composition. — Taken by half the class. Choice from—

1. Which country would you like to settle in?
2. Describe Niagara or the Mississippi.
3. Your parish church.
4. A post-office.

Arithmetic.—VI. :—

1. Divide 17 by ·0034, and multiply the result by ·4768. = 2,384.

2. Multiply the sum of ⅔, 1⅛, 1$\frac{19}{24}$ by the difference between ⅝ and 1$\frac{13}{24}$. = $\frac{77}{64}$.

3. What sum of money, with its interest, will amount to £425 12s. at 2¾ per cent. for 12 years? = £320.

4. If ⅘ cost £67 2s., what will $\frac{9}{11}$ cost? = £96 1s. 6d.

1. At what rate per cent. will £500 4s. 2d. produce £165 1s. 4½d. in 5½ years? = 6 per cent.

2. In 1875, 73,255 emigrants left this country. If this was at the rate of 2·9 per 1,000, what was the population? = 2526034·4.

3. $(\frac{3}{7} + \frac{4}{5})$ of 1 guinea $- \frac{6}{8}$ of $\frac{4}{36}$ of £1 + 1$\frac{5}{12}$ of 10s. = £1 9s. 2d.

4. 2·375 × ·00825 ÷ 4·37. = ·00448369.

Arithmetic.—VII. :—

1. If 1½ gallons leak out of a 45 gallon cask of whisky, and the leakage be made up with water, what percentage of spirit was then in the cask? = 96⅔ per cent.

2. If the Three-and-a-Half per Cents. were at par, what would I have to invest to get an income of £56 per annum? = £1,600.

3. The average sunshine in a week was 9 hrs. 48 min. 26 sec. The first two days there was no sunshine at all; the next three the average was 8 hrs. 3 min. 24 sec. Find the average for the other days. = 22 hrs. 15 min.

4. A clock which loses ·07 every minute was the right time at mid-day on Monday. What time did it show the following Monday? = 5 min. past 1.

Other sums :—

1. A man travels by rail 200 miles in 5 hrs. 30 min., 89 miles in 3 hrs., 29 miles in 2 hrs., and 35 miles in 3½ hrs. What is his average speed per hour? = 25$\frac{3}{14}$ miles.

2. A cask now holds 33⅓ gals., having lost by leakage 27 per cent. of its original contents. What quantity did the cask hold at first? = 45$\frac{5}{78}$ gals.

Geography.—Questions on New Zealand and India. Maps—India, Cape Colony, and Australia.

Grammar.—Taken from Poetry. Close questioning on prefixes and roots of common words.

Mental Arithmetic.—Taken by teacher. No exercises were given on tots or the Metric system.

Music.—

Note Tests :—*Key F.*

(*a*) l se l t d' r' m' m l se l

(*b*) m f r d s f m s ᵐl t d' r' l t d' ¹m
f r d m s l s m r d f r s d

Sight Tests :—

(*a*)

‖ 1 : 1 | —.1 : 1 | 1.1 : 1 | —: | : | 1 :— ‖
| 1 : 1.1 | 1.1 : 1 | 1 : 1 | —: ‖
‖ 1 : 1 : 1 | 1 :— :— | 1 : — : 1 | 1 ; 1 : 1 | 1 :— : 1 | 1 :— :— ‖

Ear Tests :—

(1) m f r l d r s, d
m fe s d d' ta l d'

Physiology.—Stage I.

1. Where and what are the Ulna, Tibia, Sphenoid, and Femur?

2. Describe the Spinal Column as fully as you can.

3. A cart ran over a man's chest. Say what organs and bones might be injured.

4. How are muscles attached to bones? Name an involuntary muscle. Why are involuntary muscles so called?

Inspector also questioned class on the teeth, the bones of the body, and the skin.

PUPIL TEACHERS' COURSE.

I. Geographical Notes.

(*a*) In many instances, we are sorry to say, Pupil Teachers study Geography from too narrow a point of view and too antiquated Text Books and Atlases.

This subject should be regarded not only physically, but politically, historically, commercially, and in its geological, racial, religious and biological aspects.

By no means do we contend that a *profound knowledge* of History, Geology, Biology, etc., is absolutely requisite, but that *some* acquaintance therewith is necessary for an educative knowledge of Geography. These kindred attainments, even if superficial, need not be inexact nor unproductive.

Most assuredly there is a considerable amount of geographical information which cannot be rightly appreciated unless approached from the historical side.

How can we rightly understand the location of the Celtic, Teutonic, Slav and Turkish races unless we know something of the successive migrations of mankind ; and how can we otherwise account for names of foreign origin intruding themselves in localities inhabited by alien races ?

How supremely ridiculous it would be to study the Geography of North America, to learn that English, French, Germans, Irish, Spanish, Dutch, Indians and Negroes all assist to people that continent, and yet to know nothing of the events and causes that have led to such a mingling of races !

Nay, we need not travel from England to illustrate our remarks. No student can pretend to intelligence who reads of *Daventry* (town of the two Avons), *Chester* (castra), Whitby (white town), Lincoln (a Norman corruption), without knowing their connection with the Britons, Romans, Danes and Normans respectively.

With political geography the case is similar. Why do we hold Gibraltar, Malta, Cyprus, Aden, etc., and at present occupy Egypt ? For what reasons are Tangiers, Khartoum, the Kyber Pass, Metz, Batoum, New Guinea of so considerable an importance ?

We might proceed to show how military, commercial and climatic conditions, etc., have materially assisted to bring about the geographical circumstances that now obtain, but we refrain from adding more than that Geography studied from these varied points of view will become less a matter of memory and more of judgment and reason, and that even in the lower province of mere recollection the principle of association will greatly aid the retentive faculties.

(*b*) It is a good plan to study a country from the school wall map, and daily to seek out and locate the various places mentioned in the newspapers. Just as the earnest student will pass by no uncomprehended word, but will at once upon its occurrence refer to what should be the omnipresent dictionary, so he will also consult his atlas when unfamiliar places are mentioned.

This practice will not only be of educative but utilitarian value, as the great tendency of all geographical examinations is to set questions which will stagger the crammer and exalt the widely-read man.

It is a noteworthy fact that few Pupil Teachers have any idea that the situation of a place can be learnt by looking at the index of a good atlas.

II. Musical Notes.

We are not going to define musical notes, but rather to make a few observations.

(*a*) *To find the tonic of any key with a given number of sharps.*—C is the open key of no sharps or flats. The fifth note *above* it is G, which is the tonic of one sharp ; the fifth above G is D, the tonic of two sharps. As it happens that we have five fingers upon each hand, we may utilise this correspondence to obtain mechanically the tonics required. Starting from the thumb with C, we arrive at G upon reaching the little finger, and so on.

Thmb.	1st Fing.	2nd Fing.	3rd Fing.	Little Fing.	
C	D	E	F	G	Key of G has One Sharp.
G	A	B	C	D	Key of D has Two Sharps.
D	E	F	G	A	Key of A has Three Sharps.

It may further be noted that, if the tonic be *raised* two semitones, the new key has two more sharps. Thus C has no sharps ; but D has two, E has four, and F♯ has six.

The converse of the above principles holds good, viz., that by *lowering* the tonic a fifth we reach a key with an additional flat.

Thmb.	1st Fing.	2nd Fing.	3rd Fing.	Little Fing.	
C	B	A	G	F	Key of F has One Flat.
F	E	D	C	B♭	Key of F has Two Flats.

Of course the latter results follow in the flat keys if we *raise* the tonic a fourth instead of depressing it a fifth.

Also, if the tonic be *lowered* two semitones, the new key has two more flats. Thus C has no flats ; but B♭ has two flats, A♭ has four flats, and G♭ has six flats.

(*b*) *To find the signature of any minor key.*—Remember that the signature is the same as that of the Major Key, whose tonic is a minor third above that of the required minor key.

Required the signature of A Minor. This is the same as C Major, C being a minor third above A. So also the signatures of G Major and E Minor are alike, and likewise the signatures of F Major and D Minor.

(*c*) The New Musical Syllabus for Pupil Teachers recently issued by the Education Department marks a somewhat important departure.

Until the present time, although scholars in elementary schools are examined in practical musical drill and Queen's Scholarship candidates are tested in Sight Singing, yet Pupil Teachers have altogether escaped any practical trials. This gap is now filled up by the new directions. Every Pupil Teacher may, we believe, be examined in singing by H.M. Inspector on his annual visit. Like the theoretical examination on paper, this practical examination will be optional, and one may be taken without any obligation to take the other. The practical tests will be very easy and familiar to the young teacher, as they will be very similar to those set the scholars. The Tonic Sol-fa or the Staff Notation may be employed.

The theoretical part of the syllabus also shows

considerable change, though certainly not in the direction of hardship; and the work is more equally apportioned than in the syllabus recently obtaining.

Syllabus for the Theory of Music.

Staff Notation.

1st Year.—Notes, their shape and relative value. The treble and bass staves. The scales of C, G and F major. Intervals found in the major scale. Minims, crotchets, quavers, and equivalent rests,

$\frac{2}{4}$, $\frac{3}{4}$, $\frac{4}{4}$, $\frac{2}{2}$, $\frac{3}{2}$, $\frac{4}{2}$, time.

2nd Year.—All the major scales and signatures. Dotted notes, tied notes, semi-quavers, triplets,

$\frac{3}{8}$, $\frac{6}{8}$, $\frac{9}{8}$, time.

3rd Year.—Various forms of the minor scales. The scales and signatures of C minor, D minor, E minor, and G minor. Intervals found in the minor scale. Common musical terms.

4th Year.—All the minor scales and signatures. Chromatic intervals. Easy transposition. Syncopation. Compass of voices.

Tonic Sol-fa Notation

1st Year.—The common major scale, its structure and intervals. The standard scale of pitch. Mental effects, and how they are modified. Accent. Two, three, and four pulse measures. Whole pulse notes, half-pulse notes and continuations, and rests of the same value.

2nd Year.—First removes of key. Bridge notes. Six and nine pulse measure. Quarter-pulse notes and rests. Thirds of a pulse.

3rd Year.—The minor scale and the intervals found in it. Names of chromatic notes. Relative pitch of keys. Common musical terms.

4th Year.—Chromatic intervals. Syncopation. Compass of voices.

Syllabus for the Examination in Practical Skill.

1st Year.—Tests same as for School Division III. Five songs to be presented. One to be sung.

2nd Year.—Tests same as for School Division IV. Five songs to be presented. One to be sung.

3rd Year.—Tests combining the time and tune of the requirements for School Division IV., and others founded upon the complete minor scale. Five songs to be presented. One to be sung.

4th Year.—Graded tests in tune, time, and ear training, based upon the requirements for the various school divisions. The highest marks will be given to candidates able to sing at sight passages combining the time and tune required above, and to tell ear exercises freely.

N.B.—(i) The tests can be sung from the Staff Notation or from the Tonic Sol-fa Notation at the option of the candidate.

(ii) As the application of every test (song, note, time, and ear) to 1st, 2nd, and 3rd year Pupil Teachers may occupy more time than can be given, it will suffice if each candidate is examined in time (the 3rd year in combined time and tune) and one other point.

III.—Notes on French.

(*a*) We regret to say that it has been found impossible (owing mainly to the requests of our readers, to satisfy which has occupied much space) to complete the translation of 'La Jeune Sibérienne.' In order, however, that none may be discomfited, and to meet the wants of future candidates, we have published it (both French and English juxtalinearly placed) in a more permanent form, price two shillings. A specimen copy can be had post-free by our readers from our office for eighteenpence.

(*b*) Far too often French is omitted until the fourth year of apprenticeship, and then the given book is crammed up, and grammar has to take its chance. It cannot be repeated too often or too emphatically that such a course of neglect must end in disaster.

Throughout apprenticeship the verbs in particular should be carefully studied, the regular conjugations should be at the fingers' ends, as readily as the multiplication table.

(*c*) The following verbs have been asked for during the last eleven years :—

acquérir	coucher	lever	reposer
aimer	coudre	moudre	rompre
aller	courir	mourir	savoir
apprendre	croire	obtenir	surgir
apprêter	découvrir	offrir	taire
s'asseoir	devoir	paraître	tenir
avancer	s'effacer	parler	trouver
avoir	entrer	payer	valoir
battre	être	pendre	venir
bâtir	exposer	prendre	voir
chanter	falloir	punir	vouloir
connaître	finir	ravir	
convaincre	s'habiller	recevoir	

This list would appear more appropriately in Dr. Beach's Scholarship Article, but for the fact that French should be studied, at least from the first step into the teaching profession.

In addition the examinee must be ready to parse any verb that occurs in the author, and to state its past participle.

IV. Historical Notes.

Celebrated Parliaments.

(1) 'The Mad Parliament' (1258) which passed the 'Provisions of Oxford.'

(2) 'The Blessed Parliament' (1350) which enacted the 'Statute of Treasons.'

(3) 'The Good Parliament' (1376) secured the power of impeachment.

(4) 'The Wonderful and Merciless Parliament' (1388). Two of Richard II.'s favourites were beheaded by the Lords Appellant.

(5) 'The Lack Learning Parliament' (1404) much advanced the pecuniary power and immunity of members of the Commons.

(6) 'The Reformation Parliament' (1529) abolished Papal Supremacy and suppressed the Monasteries.

(7) 'The Addled Parliament' (1614), although the elections were manipulated by James I., began to discuss grievances instead of granting money, and was promptly dissolved.

(8) 'The Short Parliament' (1640) lasted only three weeks.

PUPIL TEACHERS' ROUTINE FOR JULY.

DAYS	YEARS	FIRST WEEK			SECOND WEEK			THIRD WEEK			FOURTH WEEK		
		1st Lesson	2nd Lesson	3rd Lesson	1st Lesson	2nd Lesson	3rd Lesson	1st Lesson	2nd Lesson	3rd Lesson	1st Lesson	2nd Lesson	3rd Lesson
Monday	1	Analysis and Parsing	How to teach Writing	Physical Geog. of Rivers	Analysis and Parsing	Vulgar Fractions of Wts. & Measrs. Bracketed Vulg. Fracticns	Dates from 901 to 975 A.D.	Analysis and Parsing	How to teach Arithmetic	Reduc. of Vulgs. to Decimals. Comp. Practice	Composition or Paraphrasing	How to teach Spelling	Red. of Decimals to Vulgars Simple Proportn.
	2			Latitude		Percentages Simple Practice	Dates from 1327 to 1360 A.D.		How to teach Mental Arithmetic	Percentages. Compound Practice			Misc. Problems
	3		How to teach Form	Winds		Compound Practice. Simple Proportion	Dynastic Tables		How to teach Colour	Stocks. Fractions of Money		How to teach Number	Square Root. Fractions of Measures
Tuesday	1	Euclid I. 5. Paper Patterns of Garments	Map of Irish Sea	Scripture or Revision	Euc. I. 6. Knitting Sock	Literature, Repetition, and Writing	Scripture or Revision	Euc. I. 7. Stocking-hole mending	Physical Geography of Rivers	Scripture or Revision	Euc. I. 8. Paper Patterns of Garments	Subtr. of Algebra. Stocking-hole Mending	Scripture or Revision
	2	Euclid I. 7, 8. Paper Patterns of Garments	Map of Italy		Euclid I. 9, 10, 11 Knitting Stocking			Euc. I. 12, 13. Calico Patch	Longitude		Euc. I. 14, 15. Paper Patterns of Garments	G.C M. of Algebra Flannel Patch	
	3	Euclid I. 37, 38, 39. Paper Patterns of Garments	Map of South Africa		Euclid I. 40, 41. Any Needlework			Euc. I. 42, 43. Hedge-tear Darn	Ocean Currents		Euc. I. 44., 45. Paper Patterns of Garments	Simple Equations. Hedge-tear Darn	
Wednesday	1	History from 1012 to 1042 A.D.	Prefixes, Roots, or Affixes	Reading Aloud	History from 1042 to 1066 A.D.	Any Geography	Study Model Answers	History of the 'Heptarchy'	Prefixes, Roots, or Affixes	Any Advanced Work	Dates from 795 to 1035 A.D.	Circulating Decimals. Bills of Parcels	Study Model Answers
	2	History from 1327 to 1376 A.D.			History from 1376 to 1399 A.D.	Latitude		History from 1410 to 1422 A.D.			Dates from 1399 to 1422 A.D.	Stocks. Vulgar Fractions of Weights	
	3	History from 1649 to 1660 A.D.			History from 1660 to 1678 A.D.	Ocean Currents		Battles of the Great Rebellion			Constitutional Struggles of the Stuart Period	Stocks. Simple Proportion	
Thursday	1	Geography of Scotland	Multip of Algebra. Paper Patterns of Garments	English from Text-book	Geography of Australia	History of Roman Period	Multiplication of Algebra. Knitting Sock	Geography of Australia	Metric System	Literature, Repetition, and Writing	Geography of Ireland	History from Egbert to Canute	Composition or Paraphrasing
	2	Geography of Europe	Division of Algebra Paper Patterns of Garments		Geography of India	History from 1399 to 1410 A.D.	Div. of Algebra. Knitting Stocking	Climates of British Empire			Productions of British Empire	History from 1422 to 1461 A.D.	
	3	Geography of Africa	Algebraic Fractns. Paper Patterns of Garments		Geography of Asia	History from 1678 to 1685 A.D.	Square Rod of Algebra. Any Needlework	Geography of Asia			Geography of Asia	History from 1685 to 1688 A.D.	
Friday	1	Vulgar Frac. of Money, Measures, and Multiples	Test Examination (See appended Questions)	Test Exam. (See appended Questions)	Vulgar Fractions of Measures. Any Add. or Sub. of Vulg. Fractions	Lives of Great Historic Personages	Any Advanced Work	Multip. of Decimals Easy Multip. of Vulgar Fractions	Test Examination (See appended Questions)	Test Exam. (See appended Questions)	Circulating Decls. Household Accounts	Map of Ireland	Reading Aloud
	2	Proofs of Required Rules			Miscellaneous Problems			Stocks, Mixed Vulgars and Decimals			Stocks. Vulgar Fractions of Money	Map of Spanish Peninsula	
	3	Miscel. Problems, Simple Proportion			Prst. Worth, Disct. Mixed Vulgars and Decimals			Stocks, Fractions of Weights			Stocks. Simple Proportion	Map of Mediterranean Sea	
Saturday	1	Language	Physical Geography	Drawing	Language	Physical Geography	Drawing	Language	Physical Geography	Drawing	Language	Physical Geography	Drawing
	2												
	3	Music			Mensuration			Music			Mensuration		

(9) 'The Long Parliament' (1640) after many vicissitudes was finally dissolved 1660.

(10) 'The Rival Parliament' (1644) was assembled by Charles at Oxford. It was composed of Royalist members of the Long Parliament. It sat for three months only.

(11) 'The Rump Parliament' (1648) consisted of about fifty members, Independents of the Long Parliament.

(12) 'The Little or Barebones' Parliament' (1653).

(13) 'The First Protectorate Parliament' (1654) was notable for the newly-constituted 'House of Lords.'

(14) 'The First Convention Parliament' (1660) brought about the Restoration.

(15) 'The Pension Parliament' (1661) was strongly reactionary in the Royalist direction.

(16) 'The Drunken Parliament' of Scotland (1661) repealed all Acts passed during the Protectorate, abandoned the Covenant, and again set up the Royal authority.

(17) 'The Second Convention Parliament' (1689) gave the throne to William III. and Mary II.

(18) 'The Reformed Parliament' (1833) was the first after the Great Reform Bill of 1832.

(*For Correspondence, see end of Certificate Articles.*)

FIRST YEAR.

1. *Boys.*—Which is greater $\cdot\dot{2}\dot{3}$ of a sovereign or $\cdot\dot{2}\dot{2}$ of a guinea? Express their difference as the decimal of a shilling.

Ans. $\cdot\dot{2}\dot{2}$ of a guinea by $\cdot 0\dot{2}$s.

Girls.—Three wheels making 60, 36, and 24 revolutions in a minute start with certain points in their circumferences in contact with the ground. When will they first come all together again in the same position? Ans. 5 seconds.

2. What ambiguity might there be in such expressions as $\frac{3}{5} + \frac{4}{7} \div \frac{1}{2} - \frac{1}{8}$ of $\frac{2}{3} - \frac{1}{3}$. Where are the understood brackets?

3. Write in large hand the words '*Chalybeate Springs.*'
Write in small hand the words '*His listless length at noontide would he stretch.*'

4. Analyse the following passage and parse the words in italics:—

Helm nor hauberk's twisted mail
Nor *e'en thy* virtues, *tyrant, shall* avail
To save thy secret *soul* from *nightly* fears,
From *Cambria's* curse, *from* Cambria's tears.

5. Write out in your own words the sense of the preceding passage.

6. What is an Interjection? To what part of speech is it most akin? Mention several kinds of Interjection, giving instances. Show that Interjections are derived from various other parts of speech.

7. Draw a map of Ulster.

8. Describe the position of the English coalfields, enumerating the towns situated and the manufactures carried on within their areas.

9. Enumerate the provinces of Canada, giving their area, capitals, population, chief towns and productions.

10. What relics of the Roman occupation still exist?

11. Compare the national characteristics of the Saxons and Normans.

12. Decline *fructus* and *dies*; OR state how adjectives are compared in French.

13. Write out from memory six bars or measures of any common melody.

14. Mention ten different classes of words which present difficulties of spelling.

SECOND YEAR.

1. *Boys.*—What sum of money will amount to £413 8s. 9d. in two years at 5 per cent. per annum compound interest?

Ans. £375.

Girls.—Express the equivalent of the sum of $\frac{7}{16}$ of a guinea, $\frac{5}{12}$ of a pound, $\frac{7}{10}$ of a crown, and $\frac{7}{12}$ of a shilling as a fraction of half-a-sovereign. Ans. $\frac{119}{120}$.

2. Explain the theory of aliquot parts.

3. Writing as in First Year.

4. From what British Possessions do we obtain furs, sugar, lumber, indigo, opium, preserved fish, and wool?

5. Describe the climates of Newfoundland and New Zealand.

6. How does a ship in mid-ocean find out its Latitude and Longitude?

7. Paraphrase the following:—

For when the noble Caesar saw him *stab*,
Ingratitude, more strong than *traitors'* arms,
Quite vanquished him. Then *burst* his mighty *heart*,
And in his mantle *muffling up* his face,
Even at the base of Pompey's statue,
Which all the while ran blood, great Caesar *fell.*

8. Analyse the last three and a half lines of the above extract, and parse the italicised words.

9. Explain by reference to the prefixes or affixes, the meaning of the following words, and put each word into a sentence of your own construction:—*Affirmation, crescent, similitude, conclusion, pretend, outrage.*

10. Draw up a table, giving dates, showing the kings from 1087 to 1484, and their descent from William the Conqueror.

11. What do you know of the Mad Parliament, the Wonderful Parliament? Mention the most able Archbishops of Canterbury from 1066 to 1485.

12. *Boys.*—Write out Euclid I. 21.

If any point be taken inside a triangle, the sum of its distances from the three vertices of the triangle is less than the perimeter of the triangle.

Girls.—Describe the process of inserting a print patch. What are the most common faults?

13. Write out the Infinitive, Imperative, and Conditional Moods of *rendre*; OR, a few rules for determining the Gender of Latin nouns.

14. What increase in the number of sharps is required if the pitch of a tune be raised a note, and what is the effect on the number of flats if the key be lowered a tone? Give instances. OR, What is the effect of substituting *fe* for *fah*, and *tah* for *te*? What notes are the real tonics when these substitutions are continued until the ends of the two melodies?

THIRD YEAR.

1. *Boys.*—A tank can be filled by one pipe in 5 hours, and by another in 4 hours. The first pipe is turned on alone until the tank is half full, when the second is turned on also. How long did it take to fill the tank? Ans. $3\frac{1}{18}$ hours.

Girls.—How many dollars are equivalent to £5,327 14s. 8d. if a crown equals 1·2 dollars? Ans. 25,573·12 dollars.

2. Write out notes of a lesson on 'Multiplication of Money.'

3. Writing as in First Year.

4. Compare, generally, the physical features of Asia with those of Africa.

5. Where and what are Tobolsk, Calicut, Tchad, Antananarivo, Lassa, Saluen, Kilima-Njaro, and Kalahari?

6. Enumerate the principal deserts, giving their situation, area, and inhabiting races, of Asia and Africa.

7. Analyse this sentence:—

If a man *be* bird-witted, *that is*, quickly carried *away*, and *hath not* the patient *faculty* of attention, *let him study* the mathematics, *wherein* if the wit *wander* the demonstration must *be renewed.*

Parse the words in italic.

8. Explain in your own words the meaning of the above passage.

9. '*Most monosyllabic words are of English origin.*' Illustrate this by the names of quadrupeds and trees, and by prepositions and conjunctions.

10. What do you know of the Courts of High Commission and Star Chamber, and the First General Poor Law?

11. Enumerate all the queens, both consort and regnant, from 1485 to 1688.

12. Write out notes of a lesson on '*Cleanliness.*'

13. Conjugate the verb *Ecrire*, OR the verb *Possum.*

14. *Boys.*—Write out Euclid I. 45.

Describe a parallelogram on a given straight line equal to a given rectilineal figure and having an angle equal to a given rectilineal angle.

Girls.—Describe the making of a tucked flannel petticoat.

15. *Boys.*—The cost of 12 horses and 14 cows is £380. The cost of 5 horses and 3 cows is £130. What is the cost of each horse and cow? Ans. £20, £10.

Girls.—Describe the different kinds of animal food. How would you cook a '*neck of mutton*?'

16. *Boys.*—The span of a roof is 28 feet; each of its slopes measures 17 feet from the ridge to the eaves. Find the height of the ridge above the eaves. Ans. 9·64 feet.

Girls.—For what purposes does the body require food? What food elements fulfil these purposes?

17. What is the meaning of *prestissimo*, *sforzato*, *mezzo-forte*, *legato*, *vivace*, and *a poco a poco*?

—o—

THE 1892 SCHOLARSHIP EXAMINATION.

BY DR. GEORGE BEACH, M.A.,

Co-Author of 'A Manual of our Mother Tongue,' 'A Girls' Arithmetic,' Author of 'Elements of English,' 'Entertaining Readers,' etc.

I.—FRENCH.

(*a*) In the '*Pupil Teachers' Course*' of this number will be found a few observations on Scholarship French which should at this juncture be serviceable to our readers. It is hoped that all the Irregular Verbs there mentioned, together with those occurring in '*La Jeune Sibérienne*,' will become so familiar to the candidates that their various forms will be readily reproduced if asked for.

(*b*) With much regret we announce that it has been found absolutely impossible, owing to the pressure on our space, to completely finish the insertion of Professor Darqué's juxtalinear translation of '*La Jeune Sibérienne*.' It was all ready for issue, but the demands from our own pupils upon our columns have been so urgent and large that something had to give way.

Nevertheless, in order not to embarrass those who relied upon our help, the finished translation has been juxtalinearly published (with notes), although at this late educational season, so near the Scholarship Examination, considerable pecuniary risk has been incurred. *Our Readers may obtain a specimen copy post free by forwarding a P.O. for 1s. 6d.*

II.—HISTORY, 1890-91. (*Continued from p. 685.*)

(*a*) GENERAL EVENTS.

January, 1890.—British consulate at Lisbon assailed by the populace. Lord Napier of Magdala died.

February.—Mr. Parnell's action against the *Times* settled by the latter paying £5,000. Toronto University destroyed by fire.

March.—Opening of the Forth Bridge by the Prince of Wales. Resolution against Imperial Federation unanimously carried in the Quebec House of Assembly. International Labour Conference at Berlin. Abolition of 'Payment by Results' in Schools.

April.—Return of Mr. H. M. Stanley, the great African Explorer.

May.—Demonstration in Hyde Park in favour of 'Eight Hours a Day.'

June.—Cession of Heligoland to Germany. Mr. Stanley's 'In Darkest Africa' published.

July.—Insubordination of Metropolitan Police and 2nd Battalion of Grenadier Guards. Strike of Postmen. Forty policemen and two hundred and fifty Postmen were dismissed, and the Guards were sent to Bermuda.

August.—Death of Cardinal Newman. Dalton, an American, swam from Cape Grisnez to Folkstone in 23½ hours. Convention between England and Portugal with regard to Central Africa.

September.—Mashonaland successfully reached by an expedition of the British South African Company. Revolution in Manipur.

October.—Fire at Sydney doing £1,000,000 damages.

November.—British Protectorate over Zanzibar established.

December.—Split of the Irish Nationalists through divorce suit 'Shea *v.* Parnell.' Electrical Railway under the Thames opened. Great railway strike in Scotland.

January, 1891.—Great distress in London. Scottish Railway strike compromised. The Commons expunged resolution of 22nd June, 1880, respecting 'Mr. Bradlaugh and the Oath.'

February.—Lord Mayor's memorial to the Emperor of Russia, touching Jewish persecutions in Russia, returned. Tokar occupied by Egyptian troops.

March.—France agreed to arbitration on the Newfoundland Fisheries' Question. Murder of four hundred Goorkhas and the British Commissioner by Manipuris in Assam.

April.—Lieutenant Grant repulsed three thousand Manipuris at Thobal. Disturbances in Upper Burmah. Capture of Manipur after considerable severe fighting.

May.—Naval Exhibition, German Exhibition, Art and Industrial Exhibition, opened.

June.—First section of Manchester Ship Canal opened. Triple Alliance between Germany, Austria, and Italy renewed for six years.

July.—Visit of German Emperor. Grenadiers returned from Bermuda.

August.—Senapati of Manipur hanged. Salvationist disturbances at Eastbourne.

September.—Thermometer registered 82° F. in shade in London. Works for defence of entrances of Thames and Medway concluded. Assisted Education Act came into operation.

October.—Death of Mr. Parnell. Dynamite outrage in Dublin.

November.—Fire at Sandringham, £10,000 damages. Terrific gales and numerous wrecks.

(*b*) PARLIAMENTARY RECORD, 1890-91.

1890.—It is acknowledged on all sides that the Government displayed less tactical skill and business ability than during any of the four preceeding Sessions of this Parliament. This deterioration together with the evident obstruction of the Opposition combined to make the Session a singularly barren one. Mr. A. J. Balfour's Irish Land Purchase Bill had to be carried over to the next Session; and Mr. Goschen, despite his marvellous financial ability, is supposed to have blundered. Although there was a surplus of £3,500,000, the latter's Budget was not popular, and the general opinion was that his attempts to relieve taxation were too numerous. His proposals on the licensing question had, after a great waste of time, to be withdrawn, owing to the strenuous antagonism of the Gladstonian Liberals.

The only bills of any importance passed were the Police Bills, the Anglo-German Agreement Bill, the Census Bills, and the Western Australian Bill.

1891.—During this year, warned by their failures of 1890, H.M. Ministers succeeded in passing a series of bills, almost unequalled for their number and importance. They were considerably assisted by the paralysis of the Irish Party through its internal dissentions.

The principal measures were undoubtedly the Irish Land Purchase Bill and the Free Education Bill, but the Tithes' Rent Charge Bill and the Factories' Bill are also Acts of almost the first importance.

In order to avoid friction, and perhaps war with France, it was thought just and found necessary to apply legislative pressure to Newfoundland, but the good sense of the colonists soon obviated the need of any coercive measures.

III.—A considerable number of students, notwithstanding our previous explanations, do not appear to understand the practice and regulations regarding the examination of Reading and Recitation.

Fourth Year Pupil Teachers should be examined at their annual school examination, and if this does not take place

before the Scholarship Examination, arrangements should be made with H.M. local Inspector to hear these subjects at some convenient time and place to be fixed by himself.

Non-Pupil Teachers will be heard read and recite some time during the Scholarship Examination itself, and they will be required to prepare the same quantity of poetry as Pupil Teachers.

IV.—We give only *one* set of questions this month, and even these being merely supplementary, we do not advise our pupils to answer. Rather let them devote all the time after June to private study and exercise. But more of this further down.

V.—If space will permit WE SHALL ENDEAVOUR TO ARRANGE FOR THE APPEARANCE OF THE COMPLETE SET OF MODEL ANSWERS TO 1892 SCHOLARSHIP IN OUR AUGUST ISSUE.

VI.—ADVICE TO CANDIDATES.

(*a*) BEFORE THE EXAMINATION.—

(1) Get into robust bodily, and active mental, health by means of fresh air, exercise, and regular habits.

(2) Avoid rich and heavy food. The noon dinner during summer often upsets the equilibrium for the day. The chief meal should be in the cool of the evening after severe study is over.

(3) Don't indulge in exciting beverages, in late hours, in *too* vivacious company, but conserve all your powers, and endeavour to develop clearness and acuteness of intellect.

(4) Work up till Sunday (the 3rd instant), and then let your books severely alone. The die has been already cast.

(5) Every candidate should ascertain, by communicating with the local authority, that his seat at the examination is secure.

(6) Many candidates for denominational colleges will have to undergo an examination in Religious Knowledge. For Churchmen there are extra centres besides the collegiate ones. The questions of previous years can be had from the National Society's Depository, Westminster, price 3d., and should be purchased by all Church candidates.

(7) No candidate, even a Pupil Teacher who has sent in his name, is compelled to sit, except he has previously postponed the examination. Many will find it to their advantage to defer the examination; but in that case they must either have a new memorandum of agreement drawn up, terminable on the 31st of the July wherein they propose to sit, or their apprenticeship extended.

(8) Prepare in good time your small hand, large hand, and map pens, your black and red ink, your black, red, and blue leads, as well as penknife and indiarubber. All these should be of the best quality. Rulers will not be allowed, and blotting-paper and examination books will be provided.

(9) The Examination begins at 10 a.m. on Wednesday, 6th July, 1892. Candidates living at a distance should arrive on Tuesday, and should rather lodge in the place than flurry themselves by railway journeys.

(*b*) DURING THE EXAMINATION.—

(10) Get in a little before time, and *if possible* head your examination book.

(11) Take care and commence every paper by filling up the requisite form. Every year several candidates fail through their papers not being identified, the name being omitted.

(12) Very carefully and exactly give the requested information as to your science and drawing successes. Enter (*a*) any subjects for which you have sat this May (even although you may not have heard the results); and (*b*) any second grade passes in drawing. These latter, when they do not count for the 'D,' are yet accredited for extra scholarship marks.

(13) Additional marks will be given to candidates who present University Extension Certificates awarded by the Universities of Oxford or Cambridge, or the Universities Joint Board, London; provided that these certificates have been obtained for a course of study in a subject not mentioned in the Schedule, or in Notes 5 and 6 thereof (see Code), which has been previously approved by the Department, and is certified to have included actual attendances at not less than twenty-four weekly lectures.

(14) Don't cram between the sittings; and don't bother to compare results.

Model Answers shall be inserted in our August issue.

(15) The FAILING SUBJECTS are grammar, arithmetic, writing, reading, spelling, school-management, needlework, domestic economy, mathematics and composition.

(16) Let writing and composition be good throughout the papers, as the marks awarded for these subjects are calculated on all the exercises.

(17) Omit not the music, the map, the method questions, or those specially recommended.

(18) Work the hardest questions if possible, for the questions are not of equal value; but nevertheless, choose an easy one, well within your grasp, rather than one that will display your lack of knowledge.

(19) Don't attempt to deceive the examiner by '*padding*,' or writing around a question; and don't be 'funny.'

(20) Keep all the smaller rules such as not writing between the lines.

(21) Illustrate by diagrams whenever the slightest chance is afforded. Place them to the North-East of the answer.

Repeat Euclid figures if the page has to be turned.

(22) Let your answers display thought as to their form, arrangement, and headings.

Bring out important words by printed characters or underlining.

Consider whether a tabulated or literary answer be the the better.

(23) Deductions in Euclid, and intelligent and fully-explained arithmetical solutions count high.

(24) Look over the extract in the reading exercise before proceeding to its oral performance.

(25) First practise the copy-setting on the scrap-side of the examination-book, before writing the actual specimen.

(26) Euclid takes up much space, therefore double the page, and write in two columns.

(27) Have your watch on the desk before you. Don't spend too much time on single questions.

(28) Always reserve the last ten minutes for revision. The mathematics should, however, be revised step by step as they are put down, in order to prevent an entire problem having to be re-written.

(29) Don't leave the examination until the last moment. There is always something to be improved.

(30) Consult the ease of the Examiner in every possible way.

(*c*) AFTER THE EXAMINATION, ETC.—

(31) Any candidate who has previously failed may passively await the publication of results, for this has been his final chance.

(32) Candidates who have not previously sat should zealously continue their studies for, under any hypothesis, extra proficiency will be of great service.

(33) Until news of the examinational results arrives, the ex-Pupil Teacher has no educational status beyond that of a Fourth Year Pupil Teacher, and is not qualified as an assistant. In schools where the managers have any conscience or resources the candidate will be suitably salaried.

SELECTED GOVERNMENT QUESTIONS.

WEEK ENDING 2ND JULY, 1892.

1. Analyse and parse this sentence :—

When beggars die there are no comets seen :
The heavens themselves blaze forth the death of princes.

2. Give the meanings of the prefixes *extra-*, *ob-*, *be-*, *for-*, *anti-*. What do the suffixes *-ster*, *-ish*, *-ant*, *-let*, *-al* denote respectively? Give examples in each case.

3. Draw a map of Italy, with meridians and parallels.

4. Describe a voyage to Calcutta by the Suez Canal.

5. Explain, as to an upper class of children, the difference in time between London and Cairo; or between London and New York; and the reasons for the difference.

6. Recount the chief incidents in the reign of Elizabeth.

7. What is meant by Civil War? Say when there have been civil wars in England, and give details respecting their origin, the chief engagements which took place in connection with them, and their final results.

8. Select three of the under-mentioned persons. Say when they lived, and for what they were severally remarkable:—Dunstan, Becket, Chaucer, John of Gaunt, Cecil, Milton, the elder Pitt, Nelson, and Macaulay.

9. Write full notes of a lesson on the '*Formation and Course of rivers.*'

10. Distinguish the teaching of the '*Rule of Three*' by the method of Unity and by Proportion.

11. Show the advantages of gallery teaching for 'Lessons on Objects.' For what other lessons is a gallery useful. Give your reasons.

12. Write any form of the scale of D minor ascending and descending; OR,

Give the various forms of three and four-pulse measures.

13. Write under each of the following pairs of notes its name (second, third, or other) and quality (major, perfect, or other):—

G	B	D	B	B♭	G♯	OR,
F	F	G	F♯	F	F	

s	t	r'	te	tah	se
f	f	s	fe	f	f

14. Place time signatures before each of the following passages:—

(1)

OR,

Write two phrases in six-pulse measure.

15. A printing machine turns out 3,500 sheets per hour. If its speed be decreased in the ratio of 7 to 4, how many sheets can be printed in 12 hours? Ans. 24,000 sheets.

16. Extract the square root of ·6 to six places of decimals. Ans. ·774596.

17. The difference between the interest and discount on a certain sum for nine months at 3½ per cent. was 10s. 6d. Find the sum. Ans. £861.

18. (*Men only.*) Write out the enunciations of all the propositions by which equality between triangles is proved.

If two triangles have two sides of the one equal to two sides of the other each to each, and one angle in the one equal to another similarly situated angle in the other, and also the remaining angles of the one of the same kind, each to each, as the remaining angles of the other, the triangles shall be equal in every respect.

(*Women only.*) Write down the names in each case of three books which a teacher could profitably study in order to obtain an elementary knowledge of physiology, sanitation, cookery and servants' duties.

19. (*Men only.*) Construct a right-angled triangle, having given the perpendicular from the vertex upon the base, and the line intercepted between the middle point of the base, and the foot of the perpendicular.

(*Women only.*) Contrast in parallel columns the dietary for a week during summer and during winter of an artisan's family consisting of husband, wife, and four children of various ages.

20. (*Men only.*) Write out the principal mensuration rules for solving problems relating to the circle and the triangle.

(*Women only.*) Write out Notes of a Lesson on '*Stimulants.*'

21. (*Men only.*) If I buy oranges at 1s. 6d. per doz., and 3½ times as many apples at 4d. a doz., and after mixing them, sell them at 1s. per doz., and thereby gain 11s., how many doz. of each do I buy? Ans. 6 doz. oranges, 21 doz. of apples.

(*Women only.*) Give recipes for a bread pudding, a plain currant cake, and an apple pie.

22. (*Men only.*) Extract the square root of

$$a^2x^2 + 2abxy + b^2y^2 + 2ac^2x + 2bc^2y + c^4.$$

Ans. $ax + by + c^2$.

(*Women only.*) Describe briefly how you would make tea, coffee and cocoa.

(*For Correspondence, see end of Certificate Article.*)

LONDON MATRICULATION.

JANUARY, 1893.

OUR PREPARATION CLASS FOR PRIVATE STUDENTS.

BY T. RUSSELL MALTBY, M.A.

Kingswood School, Bath.

THE next examination for Matriculation will commence on the second Monday in January, 1893. Candidates of average attainments, if they have not already accomplished a considerable part of their work, will do well to lay their plans for the *June* Examination of next year; for although our monthly notes will bear more or less directly upon their preparation, we shall be compelled, in our scheme of work for six months, to assume some knowledge of the Matriculation subjects. The examination requires a year's direct preparation, and in dividing our course into six monthly parts, it will be necessary to mark out large portions of reading which cannot be thoroughly done by students to whom the subjects are quite new. This is only to say that the examination is a difficult one—an examination, in fact, worthy the name. Once again we urge our readers to begin hard work without delay, and to see to it that the advent of each issue of THE PRACTICAL TEACHER may find them with the month's tasks well done.

Requirements for Matriculation, January, 1893.

Candidates will not be approved by the Examiners unless they have shown a competent knowledge *in each of six subjects*, viz.:—

(1) Latin;

(2) *One* (°) of the following Languages:—Greek, French, German, Sanskrit, Arabic;

(3) The English Language; and English History, with the Geography relating thereto;

(4) Mathematics;

(5) Mechanics;

(6) *One* (†) of the following Branches of Science:—Chemistry; Heat and Light; Magnetism and Electricity; Botany.

I. LATIN.

Two papers will be set. The first (two hours) will contain:—

(1) Passages from *Horace*, Odes, Books III. and IV., to be translated into English;

(2) Questions arising out of these books;

(3) Short and easy passages for translation at sight.

The second paper (two hours) will contain:—

(1) Questions in Latin Grammar;

(2) 'Simple and easy' sentences of English to be translated into Latin. *Special stress is laid on the whole of this paper.*

II. GREEK.

One paper (three hours) will be set, containing:—

(1) Passages from *Euripides*, Heracleidae, to be translated into English;

(2) Questions arising out of the same;

(3) General Questions in Grammar;

(4) Short and easy passages for translation at sight. *Special stress is laid on the Grammar.*

° In order to meet the wishes of a larger number of candidates we shall deal with *two* of these Languages, viz.: *Greek* and *French*. Our readers will understand that only *one* of the two is to be taken up by each candidate.

† Similarly, we shall deal with *two* of these Branches of Science, viz.: *Chemistry*, and *Heat and Light*.

II. FRENCH.

One paper (three hours) will be set, containing :—

(1) Passages for translation at sight ;

(2) Questions in Grammar, limited to the Accidence.

III. ENGLISH.

Two three hours' papers will be set. The first in English Language ; the second in English History, with the Geography relating thereto. *Special stress is laid on correct Spelling and Grammar.*

IV. MATHEMATICS.

Two three hours' papers will be set. The first in Arithmetic and Algebra (to Quadratic Equations) ; the second in Geometry (the subjects of the first four books of Euclid).

V. MECHANICS.

A three hours' paper. Candidates will be expected to show a general acquaintance with the Apparatus by which the elementary principles of Physics, as enumerated in the Regulations, can be illustrated and applied. *The Regulations include Hydrostatics.*

VI. CHEMISTRY.

One three hours' paper. See Regulations.

VI. HEAT AND LIGHT.

One three hours' paper. See Regulations.

Apparatus.

1. A copy of the Regulations for Matriculation to be obtained, post free, from the Registrar of the University, Burlington Gardens, London, W. Constant reference should be made to these. For the most part they give safe indications of what the student must do, and of what he need not do.

2. Three or four sets of recent Matriculation Papers. These afford still more valuable guidance. A candidate's preparation should be constantly checked and modified by observing the scope of former papers.

3. A good dictionary should be always at hand. Whatever subject is being studied, there will always be points on which a thorough student wants immediate and concise information. We advise a one-volume dictionary, but not a small one, *e.g.*, *Blackie's Students' Dictionary* (7s. 6d.), a solid and serviceable volume, which our readers will find to be full of satisfactions and inspirations.

I. LATIN.

1. *Allen's Elementary Latin Grammar.* (Clar. Press, 2s. 6d.)

2. *Allcroft and Haydon's Latin Composition and Syntax, with Copious Exercises.* (Clive and Co., 2s. 6d.)

3. *Latin Reader*, by H. J. Hardy, for translation at sight. (Macmillan, 2s. 6d.)

4. *Horace. Odes.* By T. E. Page. Books III. and IV. (Macmillan, 1s. 6d. each.) Other useful editions are (Wickham's, 6s.), (Currie's, 3s.), (Macleane's, 2s.) ; but we hope, with the assistance of our readers' queries, to supplement Mr. Page's notes wherever further guidance is required.

5. A good Dictionary. Time spent in a good dictionary is time spent well.

There are many translations of Horace (Conington's, F. W. Newman's, Hovenden's, Lonsdale and Lee's). Mere 'cribs' should be avoided, and even respectable versions should be sparingly used. It may also be necessary for some candidates to possess the key to *Allcroft and Haydon's Exercises.* (Clive and Co., 2s. 6d.)

II. GREEK.

1. *Abbott and Mansfield's Greek Grammar* (including Syntax). (Longmans, 3s. 6d.)

2. *'Stories and Legends.'* A First Greek Reader. With Notes, Vocabulary, and Exercises. By F. H. Colson. (For practice in translation at sight.) (Macmillan, 2s. 6d.)

3. *Euripides. Heracleidae.* By C. S. Jerram. (Clar. Press, 3s.)

4. A good Lexicon.

Clive and Co. publish a translation of the *Heracleidae.*

II. FRENCH.

We are at present examining a number of French Translation Books and French Grammars. We hope to advise our readers next month. Either of the following Dictionaries will serve :—*Contanseau's* (Longmans, 3s. 6d.), *Masson's* (Macmillan, 3s. 6d.)

III. ENGLISH.

1. *Mason's English Grammar.* (Bell, 3s. 6d.)

2. *Hewitt and Beach's Manual of our Mother Tongue.* (Allen, 7s. 6d.)

3. *Ransome's Short History of England.* (Longmans, 3s. 6d.)

4. *Curtis's Outlines of English History.* (Simpkin, 6d.)

5. *Historical Atlas* (Johnston's, 2s. 6d. ; or *Gardiner's*, published by Longmans, 5s.)

IV. MATHEMATICS.

1. *Capel's Handbook of Arithmetic.* (Allen, 2s. 6d.) For many of our readers a formal course in Arithmetic will be unnecessary. Those who require further help will find it in the same author's *Catch Questions in Arithmetic.* (Allen, 4s. 6d.)

2. *Hall and Knight's Algebra.* (Macmillan, 4s. 6d.)

3. *Hall and Stevens's Euclid.* (Macmillan. Books I.-IV., 3s. Books I.-VI. and XI., 4s. 6d.)

V. MECHANICS.

In this subject also we are at present comparing the merits of a number of text-books. We hope to be able next month to advise with certainty as between our former class-book, *Magnus*, and some of its more recent rivals.

VI. CHEMISTRY.

Kemshead's (Collins, 2s.) A useful *supplement* to this somewhat crowded book is the *Synopsis of Non-metallic Chemistry*, by William Briggs. (Clive and Co., 1s. 6d.) Our readers should do their utmost to arrange for a few practical lessons in the branch of science which they take up.

VI. HEAT AND LIGHT.

R. W. Stewart's (Clive and Co., 3s. 6d.)

Courses of Study for July.

I. LATIN.

1. *Allen's Grammar, Sects. 1-85.* Nouns, Adjectives, Pronouns, Regular Verbs, Anomalous Verbs.

2. *Allcroft and Haydon, Sects. 1-55.* Observe the preface. Learn the examples.

3. *Allcroft and Haydon, Exercises I. and II.* Begin by learning the vocabularies by heart. Never use the key until your rendering is the best you can make.

4. *Horace. Odes. Book III. Carmina, I.-VI.* Make a written translation.

II. GREEK.

1. *Abbott and Mansfield.* Nouns and Adjectives.

2. *Heracleidae.* Introduction and Lines, 1-231. Compile your own vocabulary, and write out your translation. Here, *and in all your work*, mark difficulties in the margin.

II. FRENCH.

Revision of accidence and practice in translation. Compile lists of words from all sources. An extensive vocabulary is one of the essentials for Matriculation. We shall prescribe a more definite course next month.

III. ENGLISH.

1. *Mason.* Historical Outline.

2. *Hewitt and Beach, pp. 457-562.* The *Mason* should be mastered almost entire, and then *H.* and *B.* worked through carefully ; pp. 499-513, 532-546, 555-562 may be omitted.

Some of the lists on the remaining pages need not be learnt, but all should be read through. We have made the July work in English Language intentionally severe.

3. *Ransome's History to 1066, with the Geography relating thereto.* Draw your own map for each period.

IV. MATHEMATICS.

1. *Hall and Knight's Algebra. Chapters I. to VIII.* Make sure of the definitions in Chap. I. Observe the proof in Section 22. Write out formal proofs of the rules in Sections 32, 33, 35. Read off the products in Examples V.a. (See also Section 44, and Example V.f.) In Example VI.c., work out 29-34. Candidates must be *perfectly familiar* with the results of p. 41. Study carefully the examples on p. 53, and apply the methods in Example VIII.b., 26-36. Read off the answers to Example VIII.c. A neat style is particularly important in Algebra.

2. *Hall and Stevens's Euclid.* The propositions of Book I., with a few of the exercises.

VI. CHEMISTRY.

Kemshead, Chapters I., II., VII. (Hydrogen); *VIII.* (Chlorine); *IX.* (Hydro-chloric Acid). See as many experiments as possible.

VI. HEAT AND LIGHT.

Stewart. Chapters I.-IV, with the examples.

'Matriculation Queries' should be sent to the publishers before the 11th of each month. Where these are of general interest the answers will be incorporated in our notes for the following month.

NOTES AND NOTIONS.

BY RICHARD WADDINGTON,
President, Half-Time Council of Teachers.

To continue this page as 'a monthly *recueil*' of notes and jottings, hints and ideas on 'things all and sundry' in connection with the teacher and the school, must be the apology for my *début* as a gleaner of notes and notions. In taking up my somewhat disjointed parable, I can only re-echo Mr. Yoxall's desire for help from my readers to make these columns sparkle. Facts, interesting, rare, and curious, sent to me at St. James' School, Bolton, will be welcomed and duly acknowledged here.

* * * * *

THE long-looked-for report of the Select Committee on Superannuation has made its appearance. Disappointing as the document is, it is impossible not to pay a tribute to the Committee for the ability and assiduity with which it has dealt with this complex problem. To summarise the recommendations of the Committee is to expose their inadequacy. The Committee recommend that the Government subsidy should be:—

	Government subsidy for back service.	Government subsidy for future service.
A. Future Teachers		Ten Shillings
B. Existing Teachers of 10 years', or less, standing ...	Ten Shillings	
C. Existing Teachers of over 10 years, but less than 30 years	Fifteen Shillings	
D. Existing Teachers of 30 years' standing	One Pound	

The utter inadequacy of these proposals is brought out when illustrations are taken. By payment of an annual premium of £3 a future male teacher will obtain a pension of £44 at sixty years of age; and a future female teacher, paying £2 per annum and retiring at fifty-five, will obtain £27 of a pension; the existing male teacher of forty-one years of age from £26 to £41, according to length of past service; and a female teacher of forty-one years of age from £14 to £29.

* * * * *

IN attempting to discriminate between 'existing teacher,' and by introducing a differentiated subvention, the Committee had in view rather the strength of the public purse than the question of equity. There are many minor details that I hope will be omitted in the drafting of any measure. Among these I place the compulsory additional payment of '£1 per annum for each £25 of salary which he is receiving over £80 per year, or which she is receiving over £55; such contributions to be reckoned in the amount whereby the annuity is purchased on the basis of his, or her, age at the time of payment.'

* * * * *

LOOKING at the report it is impossible not to recognise that it contains much for congratulation. The right of the teacher to Government aid is acknowledged, and the unanimous recommendation of the Committee is in favour of superannuation in these words:—'It is proved that after a certain age the teachers lose the vivacity needful for success, and that unless they can be superannuated they will be retained in positions which, despite their best exertions, they cannot efficiently fill. The question thus becomes one of educational policy, as well as of benevolence towards a body of public servants.'

* * * * *

ALTHOUGH disappointed I am not dismayed by these meagre recommendations. The future of the question rests very largely with the teachers themselves. A General Election is hard by. There is remarkable unanimity in the Press in favour of the teachers. To accept the terms of the Committee would be a huge and inexcusable blunder. Too much has been made of the fear of wrecking the scheme in the past. That crisis may arrive a year or two hence when the bill is in Committee of the House, but at present there can be no danger in emphasising our just demand to something more than the beggarly pittance recommended by the Committee. I should like to see teachers agitating for a uniform pension of £60 and £75, one-third of which should be provided by the State. There are many members of the House who would be found ready to support such a demand

* * * * *

ABOLITION of the 'Annual Show Day' is now among the aims of the National Union of Teachers. The tenacity with which vice-president after vice-president has clung to the delusion that the best security the nation possesses for the return of the educational equivalent of the eight millions spent on education lies in the annual, and duly apprised, visit of Her Majesty's Inspector is appalling. Why should the whole thoughts of the teacher be concentrated for three hundred and sixty-four days on the work of the three hundred and sixty-fifth? It vitiates the educational atmosphere; cribs, cabins, and confines the school curriculum; and robs the daily routine of the school of much of the sweetness of life.

Apropos of school inspection in lieu of school examination comes the following story :—

Scene: The Street of a Lancashire Town.

Dramatis Personæ: Headmaster of a school. Scholar from school where headmaster was formerly assistant.

Master.—'Hello, Tommy! How are you getting on?'

Tommy.—'Very well, sir.'

Master.—'Well, when is your examination? It can't be far off.'

Tommy.—'I don't know, sir.'

Master.—'What, hasn't Mr.—— told you?'

Tommy.—'No, sir; but I think it can't be far off, for he's begun to shy books at us.'

The truth, in an aggravated form, perhaps, but still the truth. In how many little minds is the harass and worry, too often visible in our actions as *the visit* draws near, focussed thus? Begat of distrust, let us hope that the new *régime* will complete the record of trust by abolishing the 'Annual Show Day.'

* * * * *

A CORRESPONDENT sends me the following questions set to Standard VI. in a school where the upper standards contain about eighty per cent. of half-timers.

1. To what mountains in the West Indies do people who live there go in hot weather?

2. In what British Possession is there a great plain, no sand, few trees, and very little rain?

3. Name the 'aboriginals' of New Zealand.

4. When is it shorter to use the Passive Voice?

5. When 'if' does not introduce the Subjunctive Mood what is its use?

6. What habit is retained by the tame reindeer which was acquired in its wild state?

7. Account for the differences in temperature of places in the same latitude in Russia.

8. Is the verb 'to believe' Transitive or Intransitive, and why?

9. What *number* will exactly divide $\frac{3}{8}$ of an inch and $\frac{3}{4}$ of an inch?

10. Name any animal peculiar to New Zealand.

My correspondent suggests that these questions might be set to students in training; but I should rather see H.M. Inspectors spending a pleasant half-hour with these 'child puzzlers,' which are being used to test the knowledge of eleven and twelve year old half-timers. Although the cognomen of this Inspector would lead me to expect the atmosphere to be frigid, yet I can quite understand that during his visit it is extremely equatorial.

* * * * *

THE reasonable demand of the 7,000 teachers under the London School Board on the vexed question of corporal punishment aroused an interesting debate. Mr. Roston Bourke's story of the good-natured vicar who volunteered to take school for him was extremely good. Mr. Bourke said :—'Before leaving school, he turned to the vicar, who was a very nice man, and said, "You will find my cane in my desk, sir." "Oh, I don't want it," came the reply. When he returned the next day, the vicar told him he had very soon been obliged to use physical force; that he began by boxing the boys' ears; but by half-past ten he had resource to the cane, and even that was not sufficient; and at eleven o'clock he had to send them all home and shut up the school.' It is within the cognition of every person who has spent any time within the four walls of a school that these regulations increase corporal punishment, and that they succeed only in recruiting the street corners of our large towns with 'rowdies.' Teachers dislike corporal punishment as much as the Rev. A. Drew; but so long as boys are boys the power to administer corporal punishment will be a necessity.

* * * * *

IN addressing a public meeting in Rochdale Miss Beatrice Potter gave some wholesome advice to the Rochdale parents. She said :—'In some respects Lancashire and Rochdale were not quite so forward in the matter of education as they were in the South. From the Parliamentary returns she had discovered that whereas Oldham and Bolton and Leeds fixed their standard at VI., Rochdale could not afford its little ones more schooling than was implied by Standard V. Standard V. at Newcastle-on-Tyne was considered just sufficient schooling with which to begin half-time, and she wondered if that was the reason that Newcastle-on Tyne absorbed the most skilled industry in the country — engineering. While Newcastle fixed the half-time standard at V., Bolton and Oldham were content with III., but Rochdale accepted the very lowest rung of the educational ladder, and took Standard II. They were not merely depriving the children of so much writing, reading, and arithmetic; their actions meant something more serious. It meant a check on the physical development of the young. She found that in Rochdale a child at 10½ years was 1½ inches shorter and 5 lbs. lighter than the average National schoolchild, and at the end of that period was 11 lbs. lighter. Shrinkage of muscle meant also shrinkage of brain.'

I am pleased to see Miss Potter has the courage to tell the people of her native town the plain truth on the question of child labour.

* * * * *

THE other day I was perambulating the streets of a Northern town when my attention was called to the window of a large school. Knowing I was what she described as a 'schulemester,' an inquisitive dame wanted me to explain the peculiar appearance of one of the windows. On close examination I discovered that the 'blue sheet' containing the school accounts was duly posted on the inside of a frosted window for the information of all and sundry. Despite the most eager scrutiny not a figure could I read of the financial statement of that establishment.

The managers had successfully prevented the over-zealous parishioners from racking their brains with the intricacies of Form IX.

* * * * *

THIS calls to mind another experience. On the morning of the examination in strode a gentleman, whip in hand; and, after signing a document lying on a desk near the door, disappeared. The Inspector, after viewing the intrusion, asked who was the visitor. The visitor was the school auditor, and his business had been to sign the accounts. Just imagine the surprise of the Inspector when he found that not a single entry had been made on the financial page of Form IX., except the signature of the auditor. This

publication of accounts is a huge farce. It does not promote either veracity or economy. I saw the accounts for one school, and the salary of the two head teachers amounted to £130—a master and mistress—and the payment to the auditor was said to be £15, and lighting and cleaning cost £90. When shall we get a proper audit by a properly authorised Government auditor?

* * * * *

My predecessor, 'twice removed,' as the Irishman would say, is likely to ventilate his 'notions' in the House of Commons ere long. That we should have demolished many of our difficulties if we had been directly represented in the House requires no demonstration. The 'induction theory' has failed. Only a very close connection with Primary Education can fit a Member of Parliament to expose the iniquities of our educational system. With a teacher in the House it is easy to see that the ways of the Department would be much more circumspect. The old trick of putting off a rather pertinent query by reference to article so-and-so, section a, b, or c, of the Code, would stand small chance of success with a practical teacher able to get up and demonstrate that the said article did not in any sense bear on the subject.

Perspicacious and courageous, Mr. Yoxall is sure to be a source of anxiety to any future vice-president who fails to continue the broad-minded policy inaugurated under the present *régime*.

* * * * *

Simultaneous with the effort to free the teacher from compulsory extraneous duties ought to go the demand for non-interference with the teacher outside the school walls. Teachers ought to have the same personal and political freedom outside the school as any other citizen. How often do we hear that intimation has been conveyed to Mr. So-and-So that it will be to his interest to be less active in some particular cause? This happens under large School Boards even; and under some of the minor forms of school government the case of the teacher is a sorry one. Here is the case of a young lady teacher who is engaged to a gentleman who attends a Nonconformist place of worship. The clerical manager acquaints her with his opinion thereon, and places before her these three courses, from which she is peremptorily commanded to choose one: Convert the gentleman and bring him to church; break the engagement; leave the school.

* * * * *

Under Section 26 of the Factory and Workshop Act the Home Secretary is empowered to raise the full-time qualifications, in addition to age, by notice in the *London Gazette*. After the 4th September next the standard is to be the standard fixed for exemption at ten years of age under the Education Act. In many towns this is the sixth, while in others it is the fourth. How the Factory Inspector is going to check irregularity passes my comprehension. Here is a factory employing children from three districts. In one the standard will be the fifth, another the fourth, and in the third the sixth. Mr. Matthews has succeeded in adding absurdity to the already ridiculous mass of contradictions and absurdities on the Statute Book relating to child labour. By the 'minute' of March 4th the Home Secretary has done much to retard education. Many towns, having fixed the standard for exemption at ten years of age reasonably high, will now find popular opinion drifting in the direction of lowering the standard, because it is also the standard for full time employment at thirteen in a factory or workshop.

* * * * *

Still more objectionable is the retention of the attendance qualification in its present form, *i.e.*, 250 attendances for each of five years in not more than two schools. In many towns the attendance qualification will be the only passport for a large percentage of the children. The making out of attendance certificates will disgust the teachers so long as the year means the Civil year. Why the simple alteration of substituting an aggregate attendance since the fifth birthday for the five civil years' attendances was not made passes comprehension. A golden opportunity of testing the advisability and applicability of attendance as the qualification has been thrown away. The one gleam of hope lies in the fact that a few months' working of the new order will suffice to awaken teachers and parents.

* * * * *

What is to be done to save the teacher without the drawing certificate? By the retention of the word 'at present' in the Code the Department aggravates and perpetuates a serious injustice. The certificates of these teachers are of less commercial value—nay, more than that, the teacher's chance of promotion is practically barred. The vice-president states that no hardship is intended. In 1890 a similar move on the part of 'My Lords,' reduced the position of the untrained teacher. The clause was successfully attacked, and, to make the teacher secure, the Department agreed to stamp the diploma so that the untrained teacher's powers should be safeguarded. Many teachers may not be aware that the untrained teacher's certificate will be stamped on application with these words:—

> 'By Order of the Committee of Council on Education. This certificate qualifies the holder to superintend Pupil Teachers. Certificates are now of one class only.—Article 64, Code 1890.'

Cannot a similar course be adopted to meet the case of the teachers without the Drawing Certificate?

* * * * *

The Conference of School Board Clerks at Aberdeen in Whit week appears to have been extremely successful. The president's address was both able and interesting. It is gratifying to find the clerk of so large a school board as that of Manchester saying:—'I think that the standard qualification for exemption should be abolished, and that the pass for labour should depend alone upon age and previous school attendance.'

To the statement that compulsory attendance has been a great success I am not ready to assent so long as there are a million children not even enrolled, and another million absent at every school opening. I am sorry to see that Mr. Wyatt considers the half-time system an absolute necessity. Why is half-time an absolute necessity in England and not in Germany or Switzerland? Are the artisans poorer in England than on the Continent?

Apropos of school inspection in lieu of school examination comes the following story :—

Scene: The Street of a Lancashire Town.

Dramatis Personæ: Headmaster of a school. Scholar from school where headmaster was formerly assistant.

Master.—'Hello, Tommy! How are you getting on?'

Tommy.—'Very well, sir.'

Master.—'Well, when is your examination? It can't be far off.'

Tommy.—'I don't know, sir.'

Master.—'What, hasn't Mr.—— told you?'

Tommy.—'No, sir; but I think it can't be far off, for he's begun to shy books at us.'

The truth, in an aggravated form, perhaps, but still the truth. In how many little minds is the harass and worry, too often visible in our actions as *the visit* draws near, focussed thus? Begat of distrust, let us hope that the new *régime* will complete the record of trust by abolishing the 'Annual Show Day.'

* * * * *

A CORRESPONDENT sends me the following questions set to Standard VI. in a school where the upper standards contain about eighty per cent. of half-timers.

1. To what mountains in the West Indies do people who live there go in hot weather?

2. In what British Possession is there a great plain, no sand, few trees, and very little rain?

3. Name the 'aboriginals' of New Zealand.

4. When is it shorter to use the Passive Voice?

5. When 'if' does not introduce the Subjunctive Mood what is its use?

6. What habit is retained by the tame reindeer which was acquired in its wild state?

7. Account for the differences in temperature of places in the same latitude in Russia.

8. Is the verb 'to believe' Transitive or Intransitive, and why?

9. What *number* will exactly divide $\frac{2}{3}$ of an inch and $\frac{3}{4}$ of an inch?

10. Name any animal peculiar to New Zealand.

My correspondent suggests that these questions might be set to students in training; but I should rather see H.M. Inspectors spending a pleasant half-hour with these 'child puzzlers,' which are being used to test the knowledge of eleven and twelve year old half-timers. Although the cognomen of this Inspector would lead me to expect the atmosphere to be frigid, yet I can quite understand that during his visit it is extremely equatorial.

* * * * *

THE reasonable demand of the 7,000 teachers under the London School Board on the vexed question of corporal punishment aroused an interesting debate. Mr. Roston Bourke's story of the good-natured vicar who volunteered to take school for him was extremely good. Mr. Bourke said :—'Before leaving school, he turned to the vicar, who was a very nice man, and said, "You will find my cane in my desk, sir." "Oh, I don't want it," came the reply. When he returned the next day, the vicar told him he had very soon been obliged to use physical force; that he began by boxing the boys' ears; but by half-past ten he had resource to the cane, and even that was not sufficient; and at eleven o'clock he had to send them all home and shut up the school.' It is within the cognition of every person who has spent any time within the four walls of a school that these regulations increase corporal punishment, and that they succeed only in recruiting the street corners of our large towns with 'rowdies.' Teachers dislike corporal punishment as much as the Rev. A. Drew; but so long as boys are boys the power to administer corporal punishment will be a necessity.

* * * * *

IN addressing a public meeting in Rochdale Miss Beatrice Potter gave some wholesome advice to the Rochdale parents. She said :—'In some respects Lancashire and Rochdale were not quite so forward in the matter of education as they were in the South. From the Parliamentary returns she had discovered that whereas Oldham and Bolton and Leeds fixed their standard at VI., Rochdale could not afford its little ones more schooling than was implied by Standard V. Standard V. at Newcastle-on-Tyne was considered just sufficient schooling with which to begin half-time, and she wondered if that was the reason that Newcastle-on Tyne absorbed the most skilled industry in the country — engineering. While Newcastle fixed the half-time standard at V., Bolton and Oldham were content with III., but Rochdale accepted the very lowest rung of the educational ladder, and took Standard II. They were not merely depriving the children of so much writing, reading, and arithmetic; their actions meant something more serious. It meant a check on the physical development of the young. She found that in Rochdale a child at 10½ years was 1½ inches shorter and 5 lbs. lighter than the average National schoolchild, and at the end of that period was 11 lbs. lighter. Shrinkage of muscle meant also shrinkage of brain.'

I am pleased to see Miss Potter has the courage to tell the people of her native town the plain truth on the question of child labour.

* * * * *

THE other day I was perambulating the streets of a Northern town when my attention was called to the window of a large school. Knowing I was what she described as a 'schulemester,' an inquisitive dame wanted me to explain the peculiar appearance of one of the windows. On close examination I discovered that the 'blue sheet' containing the school accounts was duly posted on the inside of a frosted window for the information of all and sundry. Despite the most eager scrutiny not a figure could I read of the financial statement of that establishment.

The managers had successfully prevented the over-zealous parishioners from racking their brains with the intricacies of Form IX.

* * * * *

THIS calls to mind another experience. On the morning of the examination in strode a gentleman, whip in hand; and, after signing a document lying on a desk near the door, disappeared. The Inspector, after viewing the intrusion, asked who was the visitor. The visitor was the school auditor, and his business had been to sign the accounts. Just imagine the surprise of the Inspector when he found that not a single entry had been made on the financial page of Form IX., except the signature of the auditor. This

publication of accounts is a huge farce. It does not promote either veracity or economy. I saw the accounts for one school, and the salary of the two head teachers amounted to £130—a master and mistress—and the payment to the auditor was said to be £15, and lighting and cleaning cost £90. When shall we get a proper audit by a properly authorised Government auditor?

* * * * *

My predecessor, 'twice removed,' as the Irishman would say, is likely to ventilate his 'notions' in the House of Commons ere long. That we should have demolished many of our difficulties if we had been directly represented in the House requires no demonstration. The 'induction theory' has failed. Only a very close connection with Primary Education can fit a Member of Parliament to expose the iniquities of our educational system. With a teacher in the House it is easy to see that the ways of the Department would be much more circumspect. The old trick of putting off a rather pertinent query by reference to article so-and-so, section a, b, or c, of the Code, would stand small chance of success with a practical teacher able to get up and demonstrate that the said article did not in any sense bear on the subject.

Perspicacious and courageous, Mr. Yoxall is sure to be a source of anxiety to any future vice-president who fails to continue the broad-minded policy inaugurated under the present *régime*.

* * * * *

Simultaneous with the effort to free the teacher from compulsory extraneous duties ought to go the demand for non-interference with the teacher outside the school walls. Teachers ought to have the same personal and political freedom outside the school as any other citizen. How often do we hear that intimation has been conveyed to Mr. So-and-So that it will be to his interest to be less active in some particular cause? This happens under large School Boards even; and under some of the minor forms of school government the case of the teacher is a sorry one. Here is the case of a young lady teacher who is engaged to a gentleman who attends a Nonconformist place of worship. The clerical manager acquaints her with his opinion thereon, and places before her these three courses, from which she is peremptorily commanded to choose one: Convert the gentleman and bring him to church; break the engagement; leave the school.

* * * * *

Under Section 26 of the Factory and Workshop Act the Home Secretary is empowered to raise the full-time qualifications, in addition to age, by notice in the *London Gazette*. After the 4th September next the standard is to be the standard fixed for exemption at ten years of age under the Education Act. In many towns this is the sixth, while in others it is the fourth. How the Factory Inspector is going to check irregularity passes my comprehension. Here is a factory employing children from three districts. In one the standard will be the fifth, another the fourth, and in the third the sixth. Mr. Matthews has succeeded in adding absurdity to the already ridiculous mass of contradictions and absurdities on the Statute Book relating to child labour. By the 'minute' of March 4th the Home Secretary has done much to retard education. Many towns, having fixed the standard for exemption at ten years of age reasonably high, will now find popular opinion drifting in the direction of lowering the standard, because it is also the standard for full-time employment at thirteen in a factory or workshop.

* * * * *

Still more objectionable is the retention of the attendance qualification in its present form, *i.e.*, 250 attendances for each of five years in not more than two schools. In many towns the attendance qualification will be the only passport for a large percentage of the children. The making out of attendance certificates will disgust the teachers so long as the year means the Civil year. Why the simple alteration of substituting an aggregate attendance since the fifth birthday for the five civil years' attendances was not made passes comprehension. A golden opportunity of testing the advisability and applicability of attendance as the qualification has been thrown away. The one gleam of hope lies in the fact that a few months' working of the new order will suffice to awaken teachers and parents.

* * * * *

What is to be done to save the teacher without the drawing certificate? By the retention of the word 'at present' in the Code the Department aggravates and perpetuates a serious injustice. The certificates of these teachers are of less commercial value—nay, more than that, the teacher's chance of promotion is practically barred. The vice-president states that no hardship is intended. In 1890 a similar move on the part of 'My Lords,' reduced the position of the untrained teacher. The clause was successfully attacked, and, to make the teacher secure, the Department agreed to stamp the diploma so that the untrained teacher's powers should be safeguarded. Many teachers may not be aware that the untrained teacher's certificate will be stamped on application with these words:—

> 'By Order of the Committee of Council on Education. This certificate qualifies the holder to superintend Pupil Teachers. Certificates are now of one class only.—Article 64, Code 1890.'

Cannot a similar course be adopted to meet the case of the teachers without the Drawing Certificate?

* * * * *

The Conference of School Board Clerks at Aberdeen in Whit week appears to have been extremely successful. The president's address was both able and interesting. It is gratifying to find the clerk of so large a school board as that of Manchester saying:—'I think that the standard qualification for exemption should be abolished, and that the pass for labour should depend alone upon age and previous school attendance.'

To the statement that compulsory attendance has been a great success I am not ready to assent so long as there are a million children not even enrolled, and another million absent at every school opening. I am sorry to see that Mr. Wyatt considers the half-time system an absolute necessity. Why is half-time an absolute necessity in England and not in Germany or Switzerland? Are the artisans poorer in England than on the Continent?

RECREATIVE BOTANICAL PAPERS.

BY PROFESSOR J. R. GREEN, M.A.,

Examiner to the University of Cambridge.

IV. JULY.

Now that summer is with us in earnest, we must try to increase our acquaintance with the wild flowers of our country-side as thoroughly as we can. This month and next will give us far more opportunities than any other time, for the great majority of our English flowers are now appearing. Indeed, their very profusion forms our chief difficulty, for it seems almost impossible for us to study even those which almost every meadow shows us. Not to get bewildered among them, we will confine our attentions to some of the more prominent ones, and especially select those which belong to the third great sub-class, the *Corollifloræ*, which differ from our other specimens by having their petals all combined together. We should, however, take the opportunity of adding a few to the members of *Thalamifloræ* and of *Calycifloræ*, which we have already in our herbarium. Perhaps it will be best for us to collect these first, and at the outset let us put under contribution the garden as well as the open country.

The first natural order of *Thalamifloræ*, you will remember was *Ranunculaceæ*, the order of the buttercup and its relations. We can find in the garden now some very showy flowers of this order, which differ a good deal in some particulars from those we have already gathered. There is in many a cottage-garden, staring us in the face, a plant with very tall, erect stems, bearing much divided leaves and stalks or racemes of pale bluish-grey, or dark-blue flowers of very singular shape, the top part looking like a helmet which covers in the rest of the flower. This is the *aconite*, a plant which yields to the druggist that potent medicine which bears the same name. The coloured part you see is the calyx; the corolla is shut up inside the helmet-shaped structure. Two of the petals are more in appearance like stamens, rising as long, slender stalks, crowned by a little expanded head; they are at the back of the flower and extend upwards into the helmet. The other petals are very small, and lie quite at the bottom of the flower. There are indefinite stamens, too, surrounding three carpels, which, when ripe, form follicles. A follicle is a fruit a good deal like the pod of a pea, but, instead of opening by two sutures, it only opens by one.

Something like the aconite is another very showy flower, which will most likely be found in the same garden. This is the *larkspur*. It has a blue calyx, one sepal of which forms a very long spur, or pointed projection, which is hollow, and generally is full of honey. Into this spur two of the petals extend prolongations, which can best be seen by cutting the spur open. The other petals are smaller and have a curiously fringed edge. The fruit of the larkspur, again, is composed of follicles.

The *columbine* is another showy Ranunculaceous flower. Like the larkspur it is spurred, but the spurs do not come from the calyx, but the corolla. Each petal has a long spur extending from it backwards, so that the flower is regular. It is a very handsome one, too, being formed of blue, purple, or pink colours.

Our *Cruciferæ* can be enriched by the addition of many wild flowers now, but they generally are not very showy. We can find one of them in the hedgerows with white flowers, and when we pick the plant or bruise it, we shall perceive a strong odour of the onion. This is known as *Alliaria*, called by the country people 'sauce-alone.' We can find, too, in the brooks, the true *nasturtium*, or *watercress*.

The chickweed has some relations which we shall find on the banks under the shadow of the hedges. They are larger than the chickweed and have more showy flowers. One of them is known by its very straggling habit of growth and the somewhat grass-like leaves which it bears. From this peculiarity it derives its Latin name, which is *Stellaria graminea*. It is commonly called the *lesser stitchwort*. The *greater stitchwort* is also commonly to be met with now. It is something like the other one, but rather coarser in its growth, having leaves which are broader and not quite so long. You will find other specimens of the same family, which will give you opportunities of testing your powers of recognising the clove family. Remember that they all have opposite leaves; that the stem is swollen where the leaves are joined to it; that the flower is regular, with ten stamens; and that the seeds are attached in the fruit to a placenta, which rises freely into the centre of the seed-box, and is not attached anywhere to its sides.

You will be able to find other species also of the St. John's Wort, the representative of the order *Hypericaceæ*; but these will only differ in small points from the one we gathered last year. A good many more species of geranium may also be found, which you must compare with the little *Herb Robert*. You will see that there are conspicuous differences in the shapes and texture of the leaves.

Let us now look for some additions to our Calyciforal plants. The furze and sweet pea have abundant relations now in flower, all showing the same peculiarities of form of corolla. By the dusty, dry roadside we find the prickly, creeping *Restharrow*, with long, tough roots, which make it very difficult to get up; in the fields large quantities of *clover*, both red and white, the yellow *trefoil*, and the showy *sainfoin*; in the grass by the roadside, the pretty little bird's-foot trefoil; and wandering over the hedges, the graceful climbing *vetch*. All these have the pod-like fruit which gives the name to the order, *Leguminosæ*.

The Rose tribe, *Rosaceæ*, will also yield us some familiar specimens. In moist meadows the tall *meadow sweet*, with its densely-crowded, yellowish white, fragrant flowers, is now quite frequent. Not beautiful, but very curious, is the common Avens, or *Herb Bennet*, with its dry clusters of red fruit. The fruits are dry achenes, something like those of the buttercup, but the style is very long, and has an abrupt joint rather more than half-way up. As the fruit ripens this joint becomes more prominent, and forms a curious hook that attaches the fruit to any object with which it comes into contact. This helps Avens to secure the scattering of its fruit, and hence the extension of the species, for it wanders thus by outside help for considerable distances. Avens used to be thought highly of by the country folk, for its root was formerly used to give to country ale a clove-like flavour, and to keep it from turning sour. Where we found the restharrow we shall probably come

across a pretty yellow flower something like a buttercup at first sight, but when examined closely seen to belong to Rosaceæ, from its stipulate leaves and persistent calyx. This is the *silver weed*, *Potentilla anserina*.

Umbelliferæ, which before was represented only by the beaked parsley, has now many flowers in bloom. They are much like the beaked parsley in the shape of their leaves and the features of their flowers, so that they could hardly be thought to belong to any other natural order. The *wild angelica* grows in wet places, and bears white flowers tinged with pink. Its aromatic stems, when candied, form a favourite sweetmeat. *Wild celery* and *wild parsnip* may also be found; while the poisonous *hemlock*, with its handsome spotted stem and graceful foliage, is not uncommon. In many brooks, with not too rapidly running water, we find a very near relation of the garden *celery*. If we find ourselves at the seaside, where the beach is sandy, we may find a very curious member of this family, the *sea holly*, with large, almost undivided prickly leaves and conical heads of bluish-white flowers, that at first sight do not look like Umbelliferæ at all, but which, nevertheless, belong to it.

But now we will turn from these, which seem to us like old friends, to get together some representatives of the great corollifloral sub-class, so that we may see something of the leading natural orders which it comprises. We shall find a number of them close at hand in the garden, and as to the fields and hedgerows, they are loaded with them. We must only, at the outset, attempt a few of the orders, leaving others to be dealt with next month, as they are so abundant.

The garden will supply us with *sage*, *pennyroyal*, *marjoram*, and *thyme*, abundant now in the herb-bed; and with *lettuce*, *tomato*, and *potato* from the kitchen garden. In the flower border we may find *musk*, *lavender*, *snap-dragon*, and *marigold*, with probably *foxglove* and *sunflower*—a good beginning. Exploring hedgerow and lane, we shall be certain to have our garments caught by the rough stems and leaves of the *goose-grass* or *cleavers*, while we gather the blossoms of the *cornflower*, the *thistle*, the *yarrow*, and the *chamomile*. Here, too, we may find the pretty snow-white flowers of the *woodruff*, which, when dried, have the lovely fragrance of new-mown hay. From the ditch let us take the *white dead nettle*, harmless, though often feared, resembling as it does the stinging nettle, though the similarity is only superficial. We will gather, too, the *yellow toad-flax* and the *forget-me-not*, and look, besides, for the climbing *bitter-sweet*.

These must suffice for our morning's work, and with the collection spread out before us, we will try to separate them into their natural groups.

First, let us take the contribution from the herb-bed, the sage, thyme, marjoram, and pennyroyal; to them add the dead nettle and the lavender blossom, whose 'meikle rare perfume' reminds us of fragrant linen. A glance will show us that all these are much alike in the general appearance of their stems and leaves. Their stems are square, the angles being very sharply marked. From each side the leaves are springing with great regularity of arrangement. They originate in pairs from opposite sides of the stem, and each pair is at right angles to the pairs above and below it. No other natural order shows this mode of arrangement so well as this; to use the language of the botanical text-books, the leaves are *opposite* and *decussate*. The flowers vary in colour and in size, but the same shape goes through the whole group. Both calyx and corolla seem to be made of a tube with two separate pieces gaping from its open end. The calyx is a deeper cup than the corolla, and the margins are not so long. The upper lip has three sharp-pointed teeth, and the lower one has two. They are green and rather sharply ribbed. The corolla, in most, is purple, but in the dead nettle this is replaced by white. The lower lip has now three teeth, which in some of the forms are broad and flattened. The upper one, of two teeth, stands erect and arches over the stamens, which can be seen through the gaping mouth. The dead nettle shows us distinctly how well this is adapted to keep the rain from washing away the pollen from the stamens. These latter are only four in number, instead of five, as we should have expected, and these four are arranged in two pairs, standing quite close to each other at the back of the flower. If we carefully slit up the tube of the corolla we shall find the four are really two pairs, of two each, which are attached to the tube at some distance down. The filaments or stalks of the stamens are not of the same length, two being longer than the others. Such a mode of insertion botanists call *didynamous*—a word recalling the name *tetradynamous*, given to those of the *Cruciferæ*.

The attachment of the stamens to the tube of the corolla is almost universal in the *Corolliflorœ*, and is the feature of the flower which has given its name to the sub-class, just as the attachment of the stamens to the thalamus led to the term *Thalamiflorœ*.

The ovary is, as usual, quite in the centre of the flower. We can see its structure best by looking at one which is rather old; indeed, if the corolla has fallen off so much the better. In the centre we see four little cushion-like bodies, each of which contains a single ovule, and these four are placed so as to occupy the four angles of a square. In the middle, where they all touch one another, is to be found the style, springing right from the base of them and rising up side by side with the two pairs of stamens. These four little bodies form in the fruit four little nutlets, each one-seeded. Though apparently derived from four carpels, this is not really the case, only two carpels being formed, which later divide, each with two. The ovary is said to be *four lobed*.

These peculiarities mark the natural order *Labiatæ*, the name being taken from the two-lipped character of the flower.

We shall find a four-lobed ovary again in our forget-me-not, but it is associated with quite a different form of flower. The two-lipped corolla is replaced by one which looks something like a wheel, the centre where the axle would be being pale yellow, while the rest of the wheel is blue. The stamens are five instead of four, and are arranged regularly between the lobes of the corolla. Neither is the calyx two-lipped, but as regular as the corolla is. The differences also extend to the stem and leaves; the stem is round or *terete*, and the leaves are alternate instead of opposite.

The order to which the forget-me-not belongs is called *Boraginaceæ*, taking its name from the *borage* known best, perhaps, by many in connection with claret-cup. The showy *comfrey*, growing by river sides, is a member of this order; it is sometimes used as food for horses, and is said to have been employed as a substitute for spinach.

We find among our heap some more flowers with very irregular corollas, something like the *Labiatæ*. These are the musk, the toad-flax, and the snap-dragon. The foxglove is something like them, but not so strange in shape as the first three. We will examine them next, because of their resemblance to the labiates. The calyx in all is made up of five leaves or sepals united at their bases and forming a deep cup. The corollas vary a good deal; the snapdragon and toad-flax show a two-lipped character, which yet differs from the dead nettle. The latter was seen to have its lips wide apart as if gaping; the former has the lips inflated and yet closing on another, something like the lips of a mask. They can be opened by gently pulling them apart, and in the mouth so formed, we find a number of delicate hairs. Such an arrangement is known as *personate*. The foxglove is not personate, but forms a long trumpet-shaped tube, generally of purple with white spots, and this is always wide open. The musk is intermediate between the two. In all of them we have four stamens, which are like those of Labiatæ, *didynamous*.

We can always distinguish the order to which our new specimens belong, and which is called *Scrophulariaceæ*, by noticing the ovary. This is not four lobed; it is made up of two carpels, which are combined to form a two-celled ovary, containing numerous ovules, arranged on both sides of a thick fleshy placenta which occupies the centre of the ovary. When an ovary is divided thus completely with two or more cells, and the seeds are attached to the centre of the axial part of it, the placentation is said to be *axile*.

It is convenient now to remind ourselves of the three forms of placentation we have met with. The poppy had an ovary made of several carpels which were united at their edges, and bore the ovules there in a one-celled ovary with the placentas in the walls. This we learned to call *parietal* placentation. The chick-weed and its allies had the placenta rising up in the centre of the ovary, and not attached at all to its walls. This, we learned, was *free-celled* placentation. We now have met with a third form, the *axile* modification. All ovaries made up of several carpels show one or other of these kinds.

We can pass from the *Scrophulariaceæ* to study the bitter-sweet, with its marked purple and yellow flowers, the potato, and the tomato. They belong to an order which is very much like the last; indeed, there are some plants which it is very difficult to place in one rather than the other. This new order is known as *Solanaceæ*, and it takes its name from the *potato* itself, *Solanum tuberosum*. Our English forms are not likely to be confused with *Scrophulariaceæ*, because instead of having irregular corollas and stamens reduced in number, they are beautifully regular in both respects. There are five sepals forming the calyx; a corolla spreading regularly outwards, like that of the forget-me-not. In the centre are five stamens, which in the bitter-sweet and in the potato project outwards in the form of a yellow cone, and in the genus *Solanum*, to which these both belong, have their anthers attached together by their sides, something like the anthers of the violet. The ovary of our present specimens is exactly like that of the snapdragon and its relatives, being two-celled, and having axile placentation.

Solanaceæ is a very interesting natural order, because it contains such a large number of poisonous plants. Indeed, there is hardly a member of it which is not tainted somewhere. Among other drugs obtained from it we have atropine, yielded by the *deadly nightshade*. A crude form of this poison is known as belladonna. Henbane and stramonium are of great value in medicine, while tobacco, though containing a poisonous principle known as nicotine, enjoys a popularity all its own.

The rest of our specimens bring to us two other natural orders; but, as they will continue in flower throughout the summer, we will postpone the study of them till next month.

(*To be continued.*)

SCIENCE NOTES.

AUTOMATIC TELEPHONES.—With the view of increasing the number of public telephone stations, an automatic arrangement in connection with the telephone has recently been devised. Communication with the chief office is established by putting a coin into the slot, and if the line is occupied, or the person called is absent, the money is returned by the machine.

* * *

MICROSCOPIC PHOTOGRAPHY.—The movements of minute objects can now be apparently reproduced and shown to a number of spectators at the same time through the agency of an ingenious apparatus which has excited the attention of the French Academy. M. Marey, the inventor, substitutes for the ordinary objective of the microscope a special objective, an object carrier, and a powerful condenser. He thus obtains clear images, showing the movements of blood globules in and outside the capillaries, and also the movements of zoospores in the interior of cladophora and their migrations thence. Specimens of the chrono-photographs taken with a magnification of 800 diameters were exhibited and projected in order on a screen, and from the changes in position shown in the successive images, the movements of the objects, their nature and their rapidity were deduced.

* * *

A PLAGUE OF FIELD-MICE.—In Greece, the plague of field-mice which threatened to destroy the harvest is being stayed through the agency of a species of bacillus, *Bacillus typhi murium*, which has the power of producing a definite disease in mice, while without effect upon other animals. The fields of Thessaly are reported to be strewn with the corpses of mice gorged with breadcrumbs saturated with the bacillary substance.

* * *

THE INTERNATIONAL BOTANICAL CONGRESS.—Not the least interesting of this year's scientific meetings will be the International Botanical Congress at Genoa. The Congress will be inaugurated on the 5th of September, and anyone occupied in botanical study or cultivating any special branch of the science will be entitled to take part in the proceedings. On the 6th, the Hanbury Institute will be formally inaugurated. The scientific meetings of the Congress will be interspersed with excursions to Portofino, St. Margheritus Rapallo, Ruta, Recco, Ventimiglia, Mortola, and the Col di Tenda. The secretary of the organising committee is Professor O. Penzig, R. Universita, Genoa.

* * *

THE INFLORESCENCE OF THE VINE.—Signor Martelli has recently published some interesting researches into the development of the inflorescence of the vine. It appears that the two most important periods are the late summer, about August, when the axial parts of the inflorescence are first formed, and the early spring, after February, when the differentiation of the principal axis into secondary axes and flower buds takes place. Winter is a period of rest, there being then no apparent increase in the buds. The prospects of a crop of grapes for the ensuing summer may be gauged by examining in the autumn the degree of development of the third and fourth buds from the apex of the branch. Signor Martelli is of opinion that the yellow rays of the solar spectrum are those which play the greatest part in the decomposition of carbon dioxide, and the process of assimilation; the blue are those which chiefly affect the movements of stimulation and irritation; while the ultra-violet have the most effect on the production of the flowers and reproductive organs. The presence of salts of potash in the vine soil is found to be very beneficial to the vine.

* * *

THE PRESENCE OF COPPER IN FRUIT AND VEGETABLES.—The Department of Agriculture at Washington has recently been instituting investigations into the use of copper compounds as insecticides and fungicides, with the view of ascertaining whether their employment for these purposes involves the decomposition of copper

on vegetable products in such quantities as to be injurious to the health of the consumers. Under normal conditions of growth, it is stated, grapes which have never been treated with any fungicide may contain as much as two milligrams of copper per kilogram. This is equivalent to two parts in a million, and is practically the same as the average amount found in apples, plums, and other fruits that have been sprayed with Paris green or similar applications. The result of numerous analyses is that wheat may contain from four to ten milligrams of copper per kilogram, the average being 7·2. Applying these statistics to the case of the 54,887,707 bushels of wheat sent by the United States to Europe in 1890, the Americans must have exported in that year 23,495 lbs. of copper in wheat alone. It is said that sheep's liver contains 35 to 41 milligrams of copper per kilogram, and the liver of oxen 56 to 58 milligrams. Chocolate contains as much copper as 123 milligrams per kilogram.

***

UNIVERSITY EXTENSION AT EDINBURGH.—The Sixth Summer Meeting in connection with the Edinburgh Extension, which is announced to take place in August, offers an attractive programme of lectures on scientific subjects. Professor Geddes will lecture on Sociology; Professor Haddon on Anthropology; and Professor Haycraft on Physiology. Lectures will also be given on Botany, General Biology and Zoology, and the teaching of Physiology and Hygiene. An attractive feature of this summer meeting is the course of evening lectures on technical education, to be given by specialists.

***

THE PROTEIDS OF MAIZE.—From a series of experiments conducted by Mr. R. Chittenden and Mr. T. B. Osborne, it appears that the seeds of the maize contain several distinct proteids, among which are three globulins, one or more albumins, and a peculiar proteid body known as maize fibrin or zein, soluble in warm dilute alcohol, but insoluble in water. Zein is characterised by its resistance to the action of dilute alkalies, its high contents of carbon, about 55 per cent., and by the ease with which it is converted into an insoluble modification on being warmed with water, or with very dilute alcohol. Its soluble and insoluble modifications have the same percentage compositions; both respond to the ordinary reactions for proteids.

***

ELECTRIC CENSUS TABULATORS.—Electrical machines have recently been playing an important part in the compilation of census statistics in Canada. A card with a number and series of punched holes indicating age, sex, religion, and other facts was given to every person registered, and on passing these cards through an electric tabulator the answers were recorded on a number of dials. In dealing with the question of religion, the tabulator was adjusted so as to separate the cards, nearly five million in number, by sub-divisions of electrical districts into the twenty-five different religions recognised of sufficient importance to be tabulated. Every time the circuit-closing device was brought down upon the card, the operator was informed, by the movement of the hand of one of the dials and the ringing of a bell, that the religion had been registered, and so with the other facts. By the same movement of the circuit-closing device, which registered on the dial these particulars, one of a number of lids in a box attached to the instrument was lifted for each card, thus indicating the receptacle for that card, so as to separate all according to ages.

***

THE PRODUCTION OF VEGETABLE GALLS.—In an interesting communication lately made to the French Academy of Sciences, Professor Laboulbene ascribes the chief cause of the production of different vegetable galls to liquid substances proceeding from animal or vegetable gall producers. The liquid may be secreted by the cells of a gland opening into the mouth, with or without organs of suction; or transuded by the walls of the body of a larva or of a helminthe; or be furnished by a gall-producing bacterium.

***

CRYSTALLISATION OF METALS.—M. Behrens, at the Royal Academy of Sciences, Amsterdam, has been investigating the microscopic structure of alloys. He finds that crystallisation is easier and more perfect in alloys that in unalloyed metals. The various types of structure found in crystalline rocks may all be reproduced in alloys. Rectangular wickerwork is most frequent; isolated clusters of crystals less so.

***

PROPOSED BOTANIC INSTITUTE AT GLASGOW.—The trustees of the Steven Trust at Glasgow have under consideration a scheme for the erection of a Botanic Institute in the Botanic Garden, to be placed under the control of the Professor of Botany. At present the valuable herbarium of the university is perforce housed in an inaccessible attic. There is no botanical class-room, and the botanical laboratories are so small that the practical work has to be repeated three times daily to successive relays of students.

EDUCATION IN LITERATURE.

EDUCATIONAL questions of great moment to teachers frequently are discussed in reviews and magazines. In this column an attempt will be made to present the salient and most interesting features of such articles in as few words as possible, keeping always in view such points as are likely to be intrinsically acceptable to our readers. In this issue we deal with the lecture of the Rev. T. W. Sharpe, Chief Inspector of Schools, which was delivered on May 18th at the College of Preceptors, and the article, by Mr. Sinclair, on Intermittent Inspection, which appears in the June number of the *Westminster Review*.

'The common faults,' said Mr. Sharpe, by way of preface, 'on which I propose to dwell to-night, I may say at once are, or rather were, all, in some degree, faults of my own, when, in the arrogance of youth, I presumed to criticise the earnest efforts of experienced teachers, and, in the simplicity of ignorance, I was ready to believe in the loudest talkers.' The lecture touched upon three points—(1) Some faulty ideas of discipline; (2) the employment of suitable text-books; and (3) the undue magnifying of our teaching profession.

Let us sing the praises of a little healthy noise and of variety of attitudes and comfortable attitudes of body—was the gist of the lecture under the first head. 'I had at one time a great reverence for the power of commanding absolute silence, but I have learnt to prefer, even in tired moments, the busy hum and the happy, subdued laugh.' And again—'The discipline which rests on repression is rapidly giving place to the true discipline which rests upon two pillars—respect for the school and for the teacher, and interest in school work.... Corporal punishment, unless the world changes very much, will long continue to be needed for degrading vice or defiant disobedience; but it ought to cease entirely as an ordinary means of preserving discipline.' Yet I know that this unsuitable discipline of bodily pain still lingers even in infant schools. To prove this the following dramatic incident is quoted. 'Scene: An Infant School. Inspector: "What will happen if you don't do your writing well?" Chorus of children: "We shall all be slapped!"' Coming from such an authority as Mr. Sharpe we can only, upon reading the above, turn our eyes to heaven, and piously ejaculate 'Infandum!' Scene No. 2 is more reassuring. Mr. Sharpe was pointing out, to distinguished visitors, that corporal punishment did not exist in a certain excellent school. Enter mistress, with a radiant face, and announces that the new cane has just arrived from the Board! Confusion of inspector, who revives upon learning that the said cane is for weaving baskets and not for the children's backs.

'The only true discipline,' said our lecturer 'is that which interferes with individuality of character no further than is necessary for the common good, and rests upon an attentive habit, both of body and of mind. True discipline recognises that an intelligent interest in work is the true essence of true liberty of action.'

Then followed a story—too good to be true—as an example of how true discipline might be tested. An inspector once crawled into an infant school on his hands and knees contending—sensible man!—that his appearance would cause uproarious hilarity, to subdue which would give plenty of scope for the exercise of

the disciplinary powers of the mistress in charge! What think ye of that, my Masters?

The choice of text-books is not unfettered. 'The indirect action of the terrible system of examinations, which presses like a nightmare on all our best systems of education, and on our teachers,' causes books to be chosen for cramming rather than for educating. Stimulating the indolent, rousing the thoughtless, and testing our progress as compared with others, are the advantages derived from examinations; but 'they have done to education the irreparable harm of rewarding the accumulation of knowledge, rather than the power of intelligent application and extension of knowledge,' also, 'when a true knowledge of education was yet but a very tender shoot (and it is still only a modest plant) the ruthless hand of the examiner clipped its branches and bruised its tender blossoms, till education, as determined by school examinations, resembled one of those old-fashioned box trees in cottage gardens clipped into the special shapes, which the ruthless artist called an improvement upon nature.' To all of which we may devoutly say 'Amen.' The rejection of Green's History in favour of a book of dry facts, the universal use of the well-abused Mangnall's Questions are quoted as cases in point, and the education of Mr. Sharpe's eldest daughter is further stated in illustration of this pernicious system. The number of dresses found in Queen Elizabeth's wardrobe at her death, the size of the biggest cheese ever made in England, and the number of cows necessary for its production, are specimens of the intellectual pabulum which this unlucky lady had to assimilate. The examiner, the student, and the author vie with each other in giving attention to out-of-the-way facts and unimportant detail in order to be 'on the safe side.' Typical of this misguided view are the following questions:—'What king of England had a son called Alphonse?' 'What was meant by Rome-Scot? (given if I am not mistaken at a P.T. examination within the last six years). Here both value as knowledge and value for training are conspicuous by their absence. The correct view is thus given by Mr. Sharpe: 'We desire to excite in a scholar the power of acquiring knowledge for himself, and the sole object of our text-books should be to stimulate and regulate this voluntary acquisition of knowledge.'

A discussion of the question whether the reaction in favour of oral teaching has not gone too far, and altogether excluded text-books and compelled our most forward scholars to mark time, leads to a consideration of object lessons, which are invaluable 'for the habits of observation, statement, and reasoning which they encourage.' Oral teaching should 'cause our scholars to (1) observe carefully what they see, and to compare the object before their eyes with other similar objects that they have already seen; (2) to put into simple language, in words which they thoroughly understand, the observations they have made, and (3) to make simple inferences naturally suggested by these observations,' and so cultivate the faculties by following Nature herself. 'English schools,' we are told, 'owing to this want of proper object lessons, are inferior, in exactness of language, to most foreign schools,' which, if true, is a pretty strong indictment of those who control education in this much be-Coded land.

The lecturer then proceeded to recommend the inculcation of 'a wide general knowledge of natural phenomena,' backing this up by the statement that 'England wants more good all-round men,' not the mere practical worker, who can beat all the rest of the world in a few things, but an observant, thoughtful worker, who is always learning fresh application of his knowledge, and can step out of his narrow groove,' which sounds very much like a reversal of the old saw enjoining us to 'learn not many things, but much.' Drawing next comes on the *tapis*, and is discussed as follows:—'We all thought that the universal teaching of drawing was, perhaps, unnecessary, and that it might be of little use to ploughboys; but we have learnt wisdom from the sensible farmer, who said that it would teach the young labourer to plough a straighter furrow, and give a better edge to the ditch'—a very weak statement of the case for drawing.

Inductive teaching next is justly commended, and it is laid down that definitions should be framed by the children, under due guidance, through a sufficient number of leading examples, and then—and not till then—should they be learnt. 'Yet, perhaps, we have all of us been guilty of setting a boy to write essays on Honesty or Obedience, or have driven his wits out of the scholar's head by suddenly calling upon him for a reply to such a very inappropriate and inaccurate question as "What do you understand by the British Constitution?"'

'I have,' says Mr. Sharpe, 'corrected my own tendency to ask questions that are too wide or too loose, or too bookish, by setting myself to answer my own questions in short and exact terms'—a practice which is worthy of imitation by many other examiners.

The remedy for all these faults, which is rightly insisted upon by Mr. Sharpe, is 'the training of ourselves by the study of the laws of the human mind in their application to the art of teaching.' In a word 'study what you have to work upon' and the drudgery of teaching will be infinitely lessened, if not altogether removed, and the wonderful variety presented by the children of any class will be appreciated, and not dreaded, as it is, by the teacher who desires to make all his pupils' minds move in his own groove.

The lack of educational literature is next deplored, and a worthy tribute is paid to the late Mr. Quick for his excellent 'Educational Reformers,' followed by a fervent invitation to Canon Daniel to give, in book-form, to the teaching world at large, some of the educational wisdom with which he is justly credited, an invitation which all of us will cordially second.

Physical comfort and sanitary surroundings are recognised by Mr. Sharpe as worthy of the earnest consideration of both teacher and examiner. The lecturer's own practice is, in this respect also, sound and wise. 'I have learnt, at last, never to begin an examination until every member of the class is placed in the most comfortable position that will enable the mental powers to exert their full activity without physical irritation to distract them.' Those who know Mr. Sharpe will acknowledge the truth of this claim. Vertical writing receives a word of approval, and teachers are advised to look well to the type and binding of books before proceeding to criticise the subject matter.

Finally, under his third head, the reverend gentleman informs us that 'in the judgment of the world we overrate ourselves, our intellectual powers, our value to the community, our stock of knowledge,' and the old story of the Senior Wrangler, who, fresh from his academic honours, happened to enter a

London Theatre at the same time as the King, and who took the rising of the audience as a tribute to his recent triumphs, is quoted in illustration of this contention. Moreover, we are also told that an inspector, upon entering a school, the inmates of which failed to give him what he conceived to be his just meed of deference, recalled the recalcitrant scholars to a sense of their duty, and his importance, by exclaiming, in tones worthy of Bombastes Furioso, 'Rise, children! You behold Her Majesty's Representative!' That the world does not take us at our own valuation, Mr. Sharpe illustrated by an amusing personal incident. 'A costermonger's boy was pointing me out to his father. "There goes our spectre." "Spectre of wot?" returned the father. He evidently ranked me with the Inspector of nuisances, and considerably below the Inspectors of gas and water.' The remarks of Charles Lamb, in the same connection, might also have been advanced. 'We are never at ease in the presence of a schoolmaster, because we know he is not at his ease in ours. He comes like Gulliver from among his little people, and he cannot fit the stature of his understanding to yours. He is so used to teaching that he wants to be teaching you.'

As a further argument, the lecturer quoted the case of ex-schoolmaster bishops who, on account of their inability to drop the tone of command, are sometimes unpopular with their clergy. J. P. Lee, the first Bishop of Manchester, proved a signal failure as a bishop, for this reason.

The true estimate of our worth is the happy medium between our own opinion and that of the world; and because we cannot compel the world to appreciate our work at its true value, that is no reason for standing aloof and adopting a dyspeptic position of isolation.

The concluding words of this very interesting and able address were somewhat prophetic and optimistic. 'The next generation of teachers ought to be almost perfect in their discipline, their methods of teaching, and in their greater adaptability to the tone and habits of the outside world.'

Query 1. Will this new race of teachers be fine-grained enough to be eligible for inclusion in what Mr. Sharpe calls the lowest ranks of teachers—to wit, the Government Inspectors?

Query 2. Why could not such an intellectual treat as the above be given, first hand, to those teachers with whom the chief inspector is most concerned, viz., those yclept 'elementary'?

Mr. Sinclair first refers to Sir William Hart-Dyke's admission at the N.U.T. Conference, that some modification of the present plan of examining every elementary school once a year might, in the interests of education, be introduced; then to Mr. Pope's motion on Intermittent Inspection, and to the resolution of the Executive of the N.U.T. on the same subject, and proceeds to remark that the adoption by the Union of this resolution marks an important step in the direction of educational reform, as it amounts to a virtual declaration on the part of the Union, that it will wage increasing warfare against the present system. The advantages of the change would, says the writer, be threefold, viz.:—

(1) All school years would end on the same day, and the waste of time consequent upon removal would be avoided.

(2) The Standards would go.

(3) Inspectors would have to determine not *what* results had been obtained, but *how* these had been obtained.

Before this change can be introduced two reforms must precede. In the first place, not a penny of the grant must depend upon examination, and, secondly, one-man areas must be created, over each of which an inspector would preside, and in which he would 'feel it to be his duty to foster the schools, and see what work they were doing, not according to his own ideas only, but judged by information gained from master-minds throughout the country.'

Reference is then made to the happy period prior to 1862, when grants were given for machinery rather than for results, and severe condemnation is meted out to the authors of the commercial system which succeeded, when ideas of human life and human development were taken from the workshop and the exchange. Every quota of work had its money equivalent, and a large number of men were told off to apply the measuring tape to the work done, and, for results obtained, payment was granted. Thus, the machinery became the end, instead of the means, from which it resulted that the examination was always in mind, and the last three months of the school year were devoted to veneering the children's minds.

'Despite all Code changes—ay, even the long-prayed-for boon of freedom to classify—these evils still remain, intensified, rather than modified, by recent reforms,' and must and will remain, so long as examinations remain the sole test and guarantee of efficiency. Payment by results, says Mr. Sinclair, is not dead. The individual pass has, indeed, given way to the class pass, but the temptation to produce brilliant show results still remains. The weak are certainly kept back, and just as certainly more is required from those who advance, in the way of show results and veneer. Revision, the writer truly remarks, is not necessarily uneducative; but that revision which requires the child to have, at his fingers' ends, every fact which has been learnt during the year, is *cram*, which results in mind-stuffing instead of mind-training. The Rev. A. R. Vardy is quoted to show that not immediate results, but solid growth—not imparting accomplishments by the teacher, but acquisition of power by the learner—is the true desideratum, for the children may have little knowledge that can be 'weighed and tested and disgorged at the bidding of an examiner or displayed to admiring parents, and yet his observation may have been trained, logical faculty may have been developed, memory strengthened, mental vision widened, taste cultivated, and the whole life raised and enriched.' These are the true criteria of successful education, but no inspector can say whether or no they are present, for they only become apparent in that other life of the scholar, which is at once both the result and the reward of true education.

But children must have at hand a large amount of various knowledge and be ready to present it with the utmost alacrity on the examination day; hence memory is preferred to reason, readiness of recollection is placed before strength of retention. Superficial smartness and that 'quickness which is the least of the mind's properties,' are the things which pay best on that day. Thus all eyes look to the examination, the arrangements for the whole year are made with a view to the visit of H.M.I., classification, curriculum, daily progress, attendance, working staff, time-table, the

season of the year and the individuality of the inspector, are all taken into account in their bearing upon this great and stupendous event of the year.

Payment by results and competitive examinations are the outcome of that fallacy which mistakes mere acquirement for culture, but, as Thring says, 'the idolatry of knowledge had to perish, or education could not begin; knowledge-worship and the lust of the head were deadly enemies to the loving eye and the humble spirit. On this altar,' continues the writer, 'for thirty years the rising mind of this country has been sacrificed, and the lust of the head is just as apparent in the latest Code as in its predecessors, the only difference being the replacement of the individual by the class or school. To the development of power, still less of potential power, they give little or no encouragement. What shall replace this system? A regard for growth as opposed to manufacture, teachers as mind and life cultivators, and not mere shop dealers doling out instruction at so much per yard. Inspectors must not 'pull up the saplings to see that they are growing, but must rather ascertain that the seeds of life have been sown, and an environment favourable to healthy growth provided.'

So long as inspectors base their reports on an examination, and the Department regulates its grant according to one-day impressions, so long must the teacher strive, perforce, to secure what will show up on that day. It must be made the teacher's interest to prepare his pupils, not for an annual test, but for the great trial of life. Inspections should be frequent, the school should be scanned under its every day aspect, the ideals of the teacher should be learnt, and the methods by which he hopes to convert them into realities must be discussed; questions should be put on what has been learnt with a view to discovering how far an intelligent grasp of principles has been obtained, and to what extent a power of applying them has been developed; the pupil's ability to deal with new matter, his aptitude in discerning similarities, in distinguishing differences in recognising principles and overcoming difficulties, the strength, efficiency and distribution of the staff, the quantity and quality of the apparatus, the excellence of the building—these are the points which should determine the inspector's verdict; moreover, weaknesses should be pointed out on the spot, and not through the tedious machinery of departmental red tape. Right of appeal should be allowed to teachers and managers as a simple act of justice.

General intelligence and general progress should be the main things sought, the former to be gauged from the system of examination and inspection above indicated; the latter from the head teacher's register of progress.

The grant should be completely dissociated from the results of the inspection. An efficient school should receive a grant on average attendance according to the number of subjects for which due provision as regards time, staff, apparatus, and accommodation has been made. Under this system, concludes Mr. Sinclair, teachers would be free to consider the truest interests of their pupils: no hurry and no veneer would be necessary. If every teacher were to be called upon not only to show but to justify the faith that is in him, educational scamping, on which we have been paying a premium, would become impossible, and thought and thoroughness would characterise every step of the work.

The above essay is a proof that intermittent inspection is now within the sphere of practicable politics, and there is very little doubt but that it will take the place of the present nondescript system at no very distant period. We teachers should endeavour to help forward the change by advocating it, and by bringing it under the notice of every Parliamentary candidate.

Space will not permit an examination of Mr. Heller's excellent little article on 'Superannuation,' which appears in the June number of the *Educational Review*.

—o—

THE 1892 CERTIFICATE EXAMINATION.

BY DR. GEORGE BEACH, M.A.,

Co-Author of 'A Manual of our Mother Tongue,' 'A Girls' Arithmetic,' Author of 'Elements of English,' 'Entertaining Readers,' etc.

I. REMARKS ON ROUTINE:—

FIRST YEAR.

(*a*) Parse *Full, boy, For, all, throbbed, Yet, Lord Cranstoun, deigned, greet, Though, low, Me, lists, tell, what, What, how, united, forego, hour, Teviot's.* (First Friday.)

(*b*) Parse *haste, As, Unmindful, high, That, Loose, hair, down, still, crucifix, his, darkening, penitence, props, even, when, trust.* (Third Monday.)

SECOND YEAR.

(*a*) Paraphrase lines 90 to 102 of Scene 2, Act II. 'King Lear.' (Third Saturday.)

(*b*) Parse *That, if, offend, thee, justice, mine, profession, Maugre, eminence, art, False, father, Conspirant, upward, toad-spotted, Say, 'No,' arm, to prove, whereto.* (Fourth Monday.)

(*c*) Paraphrase lines 296 to 310 of Scene 4, Act I. 'King Lear.'

II. BACON'S ANTITHETA.

ESSAY XIV.

FOR	AGAINST.
1. Those who have virtue in the blood find baseness not so much alien to them as impossible.	1. It is rare for virtue to beget nobility, still rarer for nobility to beget virtue.
2. Nobility is the laurel-wreath wherewith men are crowned by Time.	2. Noblemen more often have to thank their ancestry for pardon than for advancement.
3. We respect antiquity even in lifeless monuments; how much more in living ones.	3. Such is the energy of rising men, that by their sides noblemen seem lifeless statues.
4. If one is to despise nobility in a man's relations, what will be the difference between the offspring of men and the offspring of beasts?	4. Noblemen look back too often in the race—a sign of a bad runner.
5. Nobility withdraws virtue from envy and recommends it to favour.	

ESSAY XVI.

1. Those that err through zeal should win our affection, though they cannot gain our approval.	1. As apes are uglier on account of their likeness to men, so is superstition for its likeness to religion.
2. To morality we owe mediocrity, but perfection we get from religion.	2. Just as we are compelled to hate self-will in matters of state, so ought we to hate superstition in religious affairs.
3. Superstition is but religion in the bud.	3. 'Twere better to have no opinion of God, than such an idea as is insulting to Him.
4. I would rather believe the most incredible wonders of any religion whatever, than that everything around is going or without a WILL.	4. It was not the Epicureans, but the Stoics who troubled the ancient commonwealths.

5. The constitution of the human mind is such that a man cannot be a genuine and dogmatic atheist. The man that is always handling things and never reverencing them—the great hypocrite—he is your true atheist.

III. How to Study History.

The great difficulty in studying History is the product of dry-as-dust historians, men who have merely arranged affairs in chronological order, and not in the rational sequence of cause and effect. Thus, only the memory has been exercised, and positive mental disgust has been excited by the treadmill process of learning off lists of battles, treaties, and Acts of Parliament. Candidates have been compelled to drudge among the dry bones of facts, instead of mingling with the heroes and common people of past ages—men of like passions with ourselves.

It has been well remarked that no man ever lived whose story, if properly related, would not possess, to any healthy mind, an absorbing interest.

And if this be the case, as surely it is, when we deal only with a single, an ordinary, an obscure individual, confined to paltry affairs, chilled by penury, and unexcited by lofty opportunities, how much the more would the astounding drama of a race or nation, the makers of epochs, the wielders of vast forces, the combatants in a world-wide arena, entrance the attention, excite the intellect, and arouse the emotions!

Unfortunately we have not yet arrived at the time when History has altogether found its proper position as ancillary to Sociology, and by evil chance examinations have to be passed, rather than education evolved.

How shall we proceed, then, to make the best of existing circumstances, to assist mechanical memory, and to secure as much training of the intelligence as may be?

(*a*) Get a fairly accurate knowledge of the geography and topography of the theatre of events and of the essential characteristics of the race whose history is under consideration.

(*b*) Read carefully over a mere outline of the nation's career.

(*c*) Study the lives of men, typical of their times; and, if possible, read any dramas or standard novels concerning them or their periods.

(*d*) Begin now to learn a few dates, not too many at a time, but coincidently with the further steps of your method.

(*e*) Trace the social side of the nation's path: its progress in civilization, commerce, comfort, manufactures, literature, art, science, and exploration.

(*f*) Turn next to the political aspect, and watch the advance from autocracy to aristocracy, from aristocracy to the rule of the middle class, and from this last to an ever-broadening democracy.

Be not misled by any fluctuations, but endeavour to distinguish incidental retrogressions from the general flow.

If the national course be long enough, the gradual corruption of a democracy, and the inevitable result of a military despotism, may perhaps be noted.

(*g*) Naval and military operations demand our next attention. Many of these facts must have incidentally been touched upon in any cases where they have assisted to mould character, and to advance or retard social or political progress.

This division may be again subdivided into Domestic and Foreign Wars, and each part studied separately. In cases where oft-repeated and stubbornly contested conflicts have occurred between the same combatants, these should be studied as a whole.

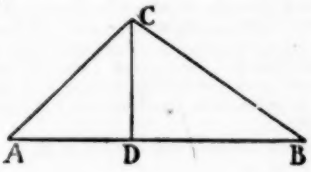
(*h*) Lastly, dynastic information should be sought, and the alliances with foreign royal houses. This branch is not proposed too late, for where our sovereigns have been truly great, or abjectly mean (*e.g.*, Elizabeth and John), we shall have made their acquaintance under heads (*c*) and (*f*), and perhaps (*g*) also.

This systematic study not only covers the ground many times, but is not so formidable as it looks. When a fact has been learned under one head, it has not to be learned again, but only arranged under another head; and the whole mass of information, bound together by many links, illuminated from many sides, and vivified by laborious intelligence, will possess a complete unity and living entity of its own.

IV. Euclid.

(*a*) Upon AB as hypotenuse it is required to construct a right-angled triangle ABC, such that if the perpendicular CD be dropped upon the base, the section DB will be equal to the side AC.

(*To save space, we shall approximate to algebraic notation.*)



Construction.

Make $BD^2 =$ rect. BA, AD (II. 11).
From D draw DC at right angles to AB.
From A, with DB as radius, cut CD in C.
Join AC and BC.
Then ACB is the required triangle.

Proof.

(*a*) $AC^2 + BC^2 = BD^2 + BC^2 = BD^2 + CD^2 + BD^2 = 2BD^2 + CD^2 = 2BD^2 + AC^2 - AD^2 = 2BD^2 + BD^2 - AD^2 = 3BD^2 - AD^2$.

(*b*) $AB^2 = AD^2 + BD^2 + 2BD,DA = 2AD^2 + 2BD,DA + BD^2 - AD^2 = BD^2 + 2BA,AD - AD^2 = BD^2 + 2BD^2 - AD^2 = 3BD^2 - AD^2$.

$\therefore$ [From (*a*) and (*b*)] $AC^2 + BC^2 = AB^2$.

$\therefore$ ACB is a right angle, etc.

Q.E.F.

(*b*) The student of Book III. Deductions should proceed systematically to work, and arrange the problems that he wishes to solve.

The elements of all the exercises are *points*, *lines*, *circles*, *chords* (internal and external), and tangents.

From these elements he can himself enunciate most of the constructions likely to be set, *e.g.*:—

Point.—

(1) From a given point to draw a line to touch a given circle.
(2) " " " " " cut a given circle so that the intercepted chord shall be of given magnitude.
(3) From a given point to draw the shortest line to meet a given circle.
(4) From a given point to draw the longest line to meet a given circle, etc.

Line.—

(5) To find a point in a given line which shall be at a given distance from a given circle.
(6) To find a point in a given line which shall be equidistant from two given circles.
(7) To find a point in a given line from which the tangents to two given circles shall be equal.
(8) To draw a common tangent to two given circles, etc.

Circle.—

(9) To draw a circle to touch a given line.
(10) " " " " two given lines
(11) " " " " a given line and pass through a given point.
(12) To draw a circle to touch a given line and a given circle, etc.

It is apparent that many other problems immediately present themselves, but any student having thus methodically prepared himself will find himself ready for any strange one presented on examination day, and indeed will probably find it an old friend in disguise, or at any rate a relation of a well-known acquaintance.

SELECTED GOVERNMENT QUESTIONS.

FIRST YEAR.

Second Week.

1. Write a large hand copy of '*Hermetically Sealed.*'
Write a small hand copy of '*Dactyls, Trochaics, and Spondees are poetical metres.*'

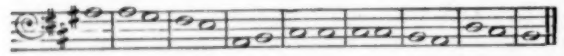
2. Write from Dictation:—
'To feel within ourselves the power of action in this or that direction, is to be conscious that we have been organically pre-

adapted to a certain environment, instead of having to fashion ourselves to it by a series of experiments requiring effort. To speak then of faculty is to treat of a fore-ordained constitutional suitability of an inherited, if latent, capability, ready to be aroused and translated into action. Now every adaptation reduces to a habit, either of the individual or the race.'

3. What is the difference between voluntary and involuntary attention? Show how the faculty of voluntary attention may be strengthened and developed by suitable exercises in a school.

4. How far may biography be usefully employed as auxiliary to the teaching of history? Give a few names of eminent persons who might wisely be chosen for this purpose, and sketch the life of one of them so as to show how the history of a period might be illustrated by it.

5. Transpose the following into the key of E.



OR,

Write the following, with bridge-notes :—

d r s fe s l l s s f l d' ta l s f f s s l t d'.

6. Write two measures or bars in $\frac{3}{4}$, $\frac{4}{4}$, and $\frac{5}{4}$ times. Introduce in each bar a dotted quaver, or a quaver rest.

Vary the contents of the two measures in each time, OR,

Fill up two measures each of two-pulse, three-pulse, and four-pulse measure, showing half-pulse notes, continuations, and rests in each example. Vary the contents of the measures in each time.

7. Write notes of a lesson on the indirect object of a verb.

8. Analyse fully the following passage :—

'And *while* he gazed *wonderingly* at her
The Lord of Astolat *came* out, to whom the Prince
Reported who he was, and on *what* quest
Sent, that he bore the prize, and could not *find*
The victor, *but* had *ridden* a random round
To seek him, and had wearied of the search.'

Parse the italicised words.

9. Explain fully why all places lying in the same latitude have equal length of day and night, while all places in the same longitude have mid-day at the same time. Show also why the frigid zones are for a certain period of the year involved in continual night or continual day.

10. Draw a map showing the coalfields and manufacturing districts of England, OR, of the river system of Africa.

11. (*Men only.*) Give an account of the climate, physical features, and productions of Queensland; point out the characteristics of different parts of the colony. Compare or contrast Queensland with New Zealand.

(*Women only.*) What parts of Africa are now parts of or are connected with the British Empire? Explain the importance, past or present, of any of these regions in the commercial and military geography of the Empire, giving some account of the relations between the British and the African races, and between the British and other Europeans with regard to Africa.

12. What was the constitution of the Star Chamber? With what purpose was it founded, and what was its power? How had its character altered before it was abolished by the Long Parliament?

13. (*Men only.*) What do you understand, ecclesiastically and politically, by *Episcopalian, Presbyterian, and Independent* in the time of Charles I.? How was the question of '*Religious Toleration*' settled by Cromwell, Charles II., and William III. respectively?

(*Women only.*) '*The reign of Edward VI. was a time of nominal Protestantism discredited by bad government; that of Mary, a time of nominal Catholicism discredited by cruelty and national failure.*' Illustrate this.

14. A mother and two children start on a long voyage, when their united ages amounted to 35 years, and were in the ratios of 356 : 39 : 25. On arriving the ages of the mother and eldest child were in the ratio of 728 : 94. Find the length of the voyage, and the ratio of the youngest child's age to the mother's on arrival. (12 months = 1 year.) Ans. 8 months; as 33 : 364.

15. A milk dealer buys pure milk at 11½d. per gallon. How much water must he add that he may sell at 5d. a quart and gain 100 per cent.? Ans. 3 of water to 20 of milk.

16. (*Men only.*) The diagonals of a rhombus are 18 and 16 yards respectively. Find its area. Ans. 144 sq. yards.

(*Women only.*) Draw a diagram of a pair of drawers for a child of five, showing the various parts of the garment. Give directions for making it up.

17. (*Men only.*) The arc of a sector of a circle is 42 yards, and the radius is also 42 yards. Find the area.

Ans. 882 sq. yards.

(*Women only.*) Prove the rule for the position of the decimal point in a product.

18. (*Men only.*) Which is the greater ratio $1 + x : 1 - x$ or $1 + x^3 : 1 - x^3$, x being less than 1 but positive?

Ans. The former.

(*Women only.*) How should you make (1) beef tea, (2) chicken broth for the use of an invalid?

19. (*Men only.*) Multiply $\left(\frac{5 + 2\sqrt{3}}{4 - \sqrt{3}}\right)^2$ by $\left(\frac{2 - \sqrt{3}}{\sqrt{3} + 1}\right)^2$ and simplify $\frac{3\sqrt{5} + 2\sqrt{3}}{4\sqrt{3} - 3\sqrt{5}}$.

Ans. $\frac{1}{3}(2 - \sqrt{3})$; $23 + 6\sqrt{15}$.

(*Women only.*) Explain as fully as you can what is meant by *nutritive food*, and name six kinds of such food in their order of value.

20. (*Men only.*) Define a plane rectilineal angle, a right angle, an obtuse angle, a triangle, an isosceles triangle, and distinguish between an axiom and a postulate.

From a given point in a given straight line draw a straight line equal to a given straight line.

(*Women only.*) What are the rules to be followed in choosing a house? What number of rooms ought a schoolhouse to contain?

21. (*Men only.*) The opposite angles of any quadrilateral figure inscribed in a circle are together equal to two right angles. Two circles intersect in PQ; through P and Q two lines RPS, TQV are drawn parallel to each other, meeting the circles in R, S, and T, V. Show that RTVS is a parallelogram.

FOURTH WEEK.

1. Write in large hand '*Hereditary adaptability.*'

Write in small hand '*Thou art not so unkind As man's ingratitude.*'

2. Write from Dictation :—

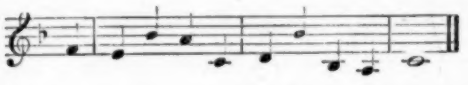
'Every power may be explained by the property of habituating itself, possessed by all living species, and which is the very foundation of educability. We know that habit, on the other hand, reduces to a series of accumulated actions and reactions, which facilitate in the future every action in the same direction. Power is therefore a residuum left by past conduct. It is action living and capitalised. The possible is a determination of the future by an analogous past; it is an inchoate adaptation.'

3. A boy comes to school for the first time on January 10th, and leaves the neighbourhood without expectation of return on March 10th. During these months he stays away on some days from illness, on others from truancy. On 10th of May he returns with the expressed intention of remaining for another year at school, but he goes out to work for the three summer months. Then he becomes recognised as a half-timer, and continues alternately at work and at school till he finally leaves on December 10th.

(*a*) Give all the entries that should be made for such a boy, both in admission and class registers.

(*b*) Show how the average of a school, whose meetings were 400 in number, would be affected by the presence of ten such boys attending for a period equivalent to twelve weeks each during the year.

4. What purpose or purposes has a teacher in view in teaching arithmetic? Show what special mental faculties are called into exercise in the study and practice of arithmetic, and give examples.

5. Write the following in the bass clef to sound one octave lower —

OR,

What other contiguous tones of the scale are separated by the same steps or intervals as (*a*) **s l t d'** and (*b*) **l, t, d r**?

6. Write the signatures of E♭, A, B, in treble clef, and of A♭ and D♭ in the bass clef; OR,

Describe the mental effects of (*a*) **rn**, (*b*) **fah**, (*c*) **te**, (*d*) **lah**, (*e*) and **d**.

CERTIFICATE ROUTINE FOR JULY, 1892 (MEN AND WOMEN, SECOND YEAR).

DAYS	FIRST WEEK.			SECOND WEEK.			THIRD WEEK.			FOURTH WEEK.		
	I.	II.	III.	I.	II.	III.	I.	II.	III.	I.	II.	III.
MONDAY	Jevons' Logic, pp. 107 to 122	Read remainder of 'King Lear'	Euclid, Book VI. first 8 Props. *or* Practise Darning	Formation of Habits and Character	Read Cantos III. and IV. of 'Last Minstrel,' *or* Trench, Lecture IV.	Euclid, Book VI., first 17 Props. *or* Tucking, Whipping, Feather-Stitching	Notes of a Lesson on 'The Thames' to Standard III.	Deductions on Euclid, Book VI. *or* Linen Patch	Paraphrase Lines 46 to 60 of 'King Lear,' Act V., Scene 3	'Herbert Spencer' pp. 20 to 38 *or* 'Locke,' Sections 155 to 166	Euclid, Book I. *or* Print Patch	Analyse Lines 127 to 142 of 'King Lear,' Act V., Scene 3 Parse difficult words
TUESDAY	Chief Dates from 1727 to 1775 *or* History from 1789 to 1802	Applications of Cube Root *or* Square Root	As in First Year *or* Geography of Mexico	History from 1603 to 1625 *or* From 1808 to 1815	Discount, Present Worth, etc.	As in First Year *or* Productions of North America	Chief Dates from 1775 to 1815 *or* Philosophy from 1789 to 1820	Mental Arithmetic	As in First Year *or* Geography of Quebec and Ontario	History from 1625 to 1649 *or* Critics, Essayists, and Biographers from 1789 to 1820	Theory of Decimals, especially 'Repeaters'	As in First Year *or* Climate and Inhabitants of North America
WEDNESDAY	Read 'King Lear,' Act I.	Variation and Proportion of Algebra *or* Choice of Food	The Assisted Education Act	Read 'Bacon's Essays' 16, 17, 18, 19 *or* Notes on 'King Lear'	Jevons' Logic, pp. 122 to 128	Quadratic Equations *or* Beverages	Mensuration *or* Any Revision	'Herbert Spencer' pp. 1 to 20 *or* 'Locke,' Sections 140 to 154	The Algebraic Progressions, *or* Post Office Facilities for Investments	Jevons' Logic, pp. 7 to 22	Logarithms *or* Apportionment of Small Incomes	Any Revision
THURSDAY	History from 1509 to 1558 *or* From 1802 to 1808	Stocks	As in First Year *or* Geography of Central America	History from 1558 to 1625 *or* From 1815 to 1820	Complex Fractions	As in First Year *or* Geography of Southern United States	History from 1625 to 1660 *or* Historians and Political Writers from 1789 to 1820	Mensuration *or* Stocks	As in First Year *or* Geography of Manitoba and N.W. Territories	History from 1660 to 1714 *or* State Trials from 1789 to 1820	Clock Sums	As in First Year *or* Mountains and Rivers of North America
FRIDAY	Permutations *or* Preparation of Food	Euclid, Book III. *or* Diagram of Woman's Night-Dress	Draw up a Routine for a Mixed Half-Time School of 200 average attendance, stating disposition of Teaching Staff	Combinations *or* Food for the Sick	Euclid Book IV. *or* Cutting-out of a Woman's Night-Dress	Mensuration *or* Any Revision	Binomial Theorem *or* Economy of Food	Deductions on Euclid Book IV. *or* Diagram Boy's Shirt	Read 'Bacon's Essays,' 21, 24, 25 and 27 *or* Notes on 'King Lear'	Binomial Theorem *or* Dietaries	Deductions on Euclid, Book III. *or* Cutting-out of Boy's Shirt	Paraphrasing (see Article)

SATURDAY																
	Major and Minor Modes	Any History *or* Geography	Grammatical Peculiarities of Shakespeare	Describe the characters of Edgar, Edmund, and the King of France	Ordinary Musical Measures	Grammar of 'King Lear'	Historical Dates *or* Any Arithmetic	Repetition, Literature, and Penmanship	Diatonic and Chromatic Intervals	Lives of Great Men	Any Dates	Paraphrasing (see Article)	Accent, Syncopation, and Musical Terms	Mensuration *or* Any Revision	Mental Arithmetic	Repetition, Literature, and Penmanship

CERTIFICATE ROUTINE FOR JULY, 1892 (MEN AND WOMEN, FIRST YEAR).

DAYS	FIRST WEEK.			SECOND WEEK.			THIRD WEEK.			FOURTH WEEK.		
	I.	II.	III.	I.	II.	III.	I.	II.	III.	I.	II.	III.
MONDAY	How to Make a Lesson Interesting	Read 'Lay of Last Minstrel,' Canto V., *or* 'Tintern Abbey'	Euclid, Book III., Props. 16 to 24, *or* Composition and Nutritive Value of Food	Graphic Illustrations of Arithmetical Principles	Study Notes to 'Lay of Last Minstrel,' *or* 'Tintern Abbey'	Euclid, Book III., Props. 25 to 32, *or* Descriptions of the various stitches	The Common Faults of Child Reasoning	Analyse Lines 350 to 365 of Canto V. of 'Lay of Last Minstrel,' *or* Lines 93 to 107 of 'Tintern Abbey.' Parse difficult words	Euclid, Book III., Props. 32 to 37, *or* Any Needlework	Notes of a Lesson on 'Derivation of Words'	Read Bacon's Essays, XXX., XXXI., XXXII., XXXVI. *or* Study Grammar from Text-book	Euclid, Book II., Props. 8 to 14, *or* Diagram of a Woman's Chemise
TUESDAY	Chief Dates from 1783 to 1802	Fractional Equations, *or* Repair of Underclothing	Physical Geography of Australia, *or* British Possessions in Africa	Chief Dates from 1802 to 1815	Algebraic Factors *or* Clothing Outfits	Effects of Climate on Industry, Productions, and National Character	Poetry from 1702 to 1789 *or* Lives of Great Men from 1153 to 1270	Simultaneous Quadratics, *or* Removal of Grease and Ink Spots, Fruit Stains, etc.	Political Geography of Australia, *or* Northern States of Africa	Chief Dates from 1056 to 1135	Geometrical Progression, *or* Ventilation	The Atmosphere, Rain, Clouds, and Vapour, etc.
WEDNESDAY	Problems on Least Common Multiple	Complex Fractions	Mensuration, *or* Theory of Common Arithmetical Rules	The Metric System	Any Revision	Mensuration, *or* Recitation	Any Revision, *or* Notes on 'Burke's Reflections'	Compound Proportion and Proportional Parts	Averages	Percentages and Commission	Any School Management	Mixtures (Arithmetic)
THURSDAY	History from 1660 to 1689, *or* Struggles in America	Problems involving Simultaneous Simple Equations *or* Description of a Flannel Print and other Patches	Political Geography of Australia, *or* Geography of Egypt	History from 1783 to 1802	Quadratic Equations, *or* Organs and Processes of Mastication and Digestion	Shape, Size, and Motions of the Earth; Latitude and Longitude	Constitutional Affairs from 1461 to 1660	Arithmetical Progression, *or* Warming and Lighting the Home	General Geography of Australia and Tasmania, *or* East Coast of Africa	History from 1802 to 1815	Theory and Practice of L.C.M. and G.C.M. of Algebra, *or* Diagram of a Pair of Drawers	The Isles of the British Empire, *or* West Coast of Africa
FRIDAY	The Human Will	Deductions of Euclid, Book I., *or* Organs and Processes of Respiration	Analyse lines 394 to 406 of Canto V., 'Lay of Last Minstrel,' and Parse difficult words, *or* study 'Burke's Reflections' to page 29	Applications and Relations of Long, Square, and Cubic Measures	Select any Archaic or Peculiar Words in 'Lay of Last Minstrel' or 'Tintern Abbey'	How to Conduct a Dictation Lesson	The best methods of preparing for and securing Recapitulation	Deductions of Euclid, Book II., *or* Cutting out of an Infant's Shirt	Read Bacon's Essays, XXV., XXVII., XXVIII., XXIX., *or* 'Burke's Reflections,' pp. 29 to 58	Notes of a Lesson on 'Spacing of Words'	Compound Interest	Read Bacon's Essays, XXXVIII., XXXIX., L., *or* 'Burke's Reflections,' pp. 58 to 84
SATURDAY	Musical Intervals	Historical Dates	Grammar from Text-books	Deductions of Euclid, Book III., *or* Any Domestic Economy	Transposition from one key to another, *or* from the Imperfect to the Perfect Method	Lives of Great Men	Map of Ganges or Nile	Deductions of Euclid, Book III., *or* Any Arithmetic	Transcription from one time to another	Historical Dates	Euclid, Book II., Props. 1 to 7, *or* Proofs of Arithmetical Rules	Composition on 'Kindness to Animals'	Musical Terms	Lives of Great Men	Any Physical Geography	Composition on 'He gives twice who gives quickly'

7. Give examples of the different uses of the Infinitive Mood.

8. Analyse the following passages, and parse the italicised words :—

(*Men only.*)

The humble boon was *soon* obtained :
The aged Minstrel *audience* gained.
But, when he reached the room of state,
Where she, with all her ladies, *sate*,
Perchance he wished *his* boon *denied* ;
For, when *to tune* his harp he tried,
His trembling hand had *lost* the ease,
Which marks security to please ;
And scenes long *past* of joy and pain
Came wildering o'er his aged brain.

(*Women only.*)

Nor less, I trust,
To them *I may have owed*, another gift,
Of aspect more *sublime* ; *that* blessed mood
In which the burthen of the mystery,
In which the heavy and the weary *weight*
Of all this unintelligible world
Is lightened :—that *serene* and blessed mood,
In which the affections gently lead us *on*—
Until, the *breath* of this corporeal frame
And *even* the motion of our human blood
Almost *suspended*, we are laid *asleep*.

9. Describe clearly the causes of two of the following :—

An Eclipse of the Sun, Trade Winds, Monsoons, Land and Sea Breezes, and the Region of Calms on either side of the equator.

10. Draw a Map of Further India, OR of the European Possessions in Africa.

11. A line of steamers runs regularly from Liverpool to the West Coast of Africa. Mention the chief ports of call, and the principal articles which form the cargo on the outward and homeward voyages respectively.

12. Show by genealogical tables or otherwise the claims of the following Sovereigns, and mention the circumstances under which they came to the throne :—Henry II., Henry IV., Edward IV., and William III.

13. (*Men only.*) Give some account of the chief events of the years 1688-1689 in England *or* in Scotland.

(*Women only.*) What were the 'Berlin Decrees?' What was the reply of the English Government?

14. If I sell a horse for £62 and a cow for £26, I gain 10 per cent. on the original cost of both ; but if I sell the horse for £63 and the cow for its original price, I lose 10 per cent. Find the original cost of each. Ans. Cow, £9 ; Horse, £71.

15. At what rate of interest will the present worth of £100 10s. 3d., payable two years hence, be £93 10s.? Ans. $3\frac{1}{2}$.

16. (*Men only.*) Of two square fields, one exceeds the other by 100 acres, and its side is longer than that of the other field by 400 yards. Find the length of the sides of the fields.
Ans. 405 yards, 805 yards.

(*Women only.*) Give a diagram of a woman's chemise, showing the various parts of the garment. Give directions for making it up.

17. (*Men only.*) The radius of a circle is 15 feet. Find the areas of the two parts into which it is divided by a chord equal to the radius. Ans. 20·382 ; 686·478 sq. feet.

(*Women only.*) Multiply 43002073252 by 133112111, using three lines of multiplication only. Ans. 5724096747950354972.

18. (*Men only.*) A merchant sold 5 doz. of sherry and 8 doz. of claret for £30. He sold 2 doz. more of sherry for £12 than he sold of claret for £10. Required, the price of each.
Ans. Sherry, 40s. per doz. ; Claret, 50s. per doz.

(*Women only.*) Explain fully what is meant by breathing ; what is the use of it, and what is the structure of the organs concerned in it?

19. (*Men only.*) Extract the square root of $7 + \sqrt{13}$.
Ans. $\frac{1}{2}(\sqrt{2} + \sqrt{26})$.

(*Women only.*) Show that mastication is in reality only the first stage in the digestive process. Describe the second stage of that process.

20. (*Men only.*) If at a given point in a straight line two other straight lines on the opposite side of it make the adjacent angles together equal to two right angles, these two straight lines shall be in one and the same straight line.

PQR, PQS, RST, RSV are equilateral triangles. Show that TP, PQ, QV are in the same straight line.

(*Women only.*) Name the different articles required in the equipment of the kitchen of a school-house, their use and cost.

21. (*Men only.*) The straight line drawn at right angles to the diameter of a circle at one of its extremities falls without the circle ; and no straight line can be drawn from the extremity between that straight line and the circumference so as not to cut the circle.

P is a point without a circle whose centre is O. If a circle be described on OP as diameter cutting the given circle in P, PQ will touch the given circle.

SECOND YEAR.

SECOND WEEK.

1. As in First Year.

2. As in First Year.

3. Discuss the relative advantages of (*a*) hot-air pipes, (*b*) hot-water pipes, and (*c*) open stoves as means of warming a school. Say at what temperature it should be kept.

4. Write notes of a lesson on '*Union is Strength*,' OR (for infants) on '*Simple geometrical forms*.'

5. As in First Year.

6. As in First Year.

7. Give instances from 'King Lear' of Double Comparatives, Double Superlatives, and Double Negatives.

8. (*Men only.*) As in First Year, Fourth Week.

(*Women only.*) Quote the substance of Trench's remarks upon the word '*dissimilation*' and the birth of the word '*Christian*.'

9. (*Men only.*) As in First Year.

(*Women only.*) Describe the flora and fauna of British North America.

10. (*Men only.*) As in First Year.

(*Women only.*) Draw a map of Nova Scotia and New Brunswick.

11. (*Men only.*) As in First Year.

(*Women only.*) Describe a voyage down the Mississippi.

12. (*Men only.*) As in First Year.

(*Women only.*) What colonies or dependencies did we capture from 1794 to 1800 inclusive?

13. (*Men only.*) As in First Year.

(*Women only.*) What events are connected with Toulon, Camperdown, Seringapatam, Copenhagen, Assaye, Cintra, and Walcheren?

14. (*Men only.*) If in an infinite Geometric series any term be equal to the sum of all that succeed it, show that the common ratio will be $\frac{1}{2}$.

(*Women only.*) Write short lives of the younger Pitt and Burke.

15. (*Men only.*) Employ the Binomial Theorem to find the Compound Interest on £100 for 5 years at 10 per cent.
Ans. £61 1s. 0·24d.

(*Women only.*) Cut out in paper the right half of a shirt for a boy ten years old.

16. (*Men only.*) A pyramid is cut into two pieces by a plane parallel to the base, midway between the vertex and the base. Show that one piece is seven times the other.

(*Women only.*) As in First Year, Question 17.

17. A train 88 yards long overtook a person walking along the line at the rate of 4 miles an hour, and passed him completely in 10 seconds. It afterwards overtook another person and passed him in 9 seconds. At what rate per hour was this second person walking? Ans. 2 miles.

18. (*Men only.*) Prove that the equilateral triangle described on the hypotenuse of a right angle triangle is equal to the sum of the equilateral triangles described on the other two sides.

(*Women only.*) Mention the most suitable forms of nutriment for an invalid forbidden to take solid food.

19. (*Men only.*) As in First Year, Question 20.

(*Women only.*) What qualities constitute the character of a good maid-servant? How may such qualities be best encouraged during school life?

20. What is the easy range of (*a*) Treble, and (*b*) Alto voices?

SECOND YEAR.

FOURTH WEEK.

1. As in First Year.

2. As in First Year.

3. Explain in what way the manual and other exercises of the 'Kindergarten' might be extended or modified so as to be useful in the upper classes of a school.

4. '*History should furnish materials for Comparative Sociology.*' Give Spencer's reasons for this maxim, and state the defects of ordinary history, OR criticise Locke's remarks on 'Severity.'

5. As in First Year.

6. As in First Year.

7. Paraphrase lines 11 to 25 of 'King Lear,' Act IV., Scene 6.

8. (*Men only.*) Give an Analysis of Bacon's 39th Essay—'*Of Custom and Education.*'

(*Women only.*) Explain, with derivation if you can, the words *Anon, benison, caitiff, defuse, esperance, fee, gad.*

9. (*Men only.*) As in First Year.

(*Women only.*) Write down the twelve most important towns of the United States, giving their population, industries, and situation.

10. (*Men only.*) As in First Year.

(*Women only.*) Describe the commerce of the United States.

11. (*Men only.*) As in First Year.

(*Women only.*) What do you know of the flora and fauna of the United States?

12. (*Men only.*) As in First Year.

(*Women only.*) What led to the war with America in 1812? Give some account of that war.

13. (*Men only.*) As in First Year.

(*Women only.*) What do you know of the Berlin Decrees, the Mutiny at the Nore, and at Spithead?

14. (*Men only.*) Show that if n be any whole number, $n(n^2-1)(n^2-4)$ is divisible by 120.

(*Women only.*) What are the chief faults to be guarded against in the 'Needlework' of Standard V.?

15. (*Men only.*) Find the coefficient of x^{29} in the expansion of $(x+x^2)^{12}$. Ans. 495.

(*Women only.*) Give dates of Siege of Toulon, Siege of Acre, Death of Pitt, Convention of Cintra, Assassination of Perceval and Treaty of Ghent.

16. (*Men only.*) The circumference of a great circle of a ball is 15·708 ft. Find the whole surface of the ball. Ans. 78·54 sq. ft.

(*Women only.*) As in First Year, Question 17.

17. I have £5,000 stock in the Three per Cents. This I transfer to the Three-and-a-Half per Cents. at 87½, thus increasing my income by £5. Find the price of the Three per Cents. Ans. 77½.

18. (*Men only.*) Equal triangles which have one angle of the one equal to one angle of the other, have their sides about the equal angles reciprocally proportional; and conversely, triangles which have one angle of the one equal to one angle of the other and their sides about the equal angles reciprocally proportional, are equal to one another.

(*Women only.*) What portion of income should, as a rule, be spent in House Rent? Explain the nature of Building Societies and of Fire and Life Insurance.

19. (*Men only.*) As in First Year, Question 20.

(*Women only.*) To what extent are shell-fish and preserved fruits useful articles of diet?

20. Are voices better trained by occasional practice for a long time, or by frequent practice for a short time? Give your reasons.

CORRESPONDENCE.

We shall be pleased to reply briefly and through these columns to anyone seeking examinational information and advice.

This privilege does not, of course, extend to furnishing the solutions and answers of problems. All such communications should be addressed to 'THE QUERY EDITOR.'

Replies demanding urgency will be promptly forwarded per post on receipt of a stamped and addressed envelope. A post will be saved by writing direct to DR. GEORGE BEACH, M.A. *(Examination Editor of Practical Teacher)*, STANLEY MOUNT, MACCLESFIELD.

E. G. (Ovenden).—We will try and meet your wishes.

C. S. (Brighton).—See this month's issue.

B. G. E. (Accrington).—You are too late for this year's Scholarship.

H. L. S. (St. Helens, Tasmania).—See within.

E. K. (Osmotherley).—1. H.M.I. is within his rightful execution of duty. 2. If you work to the Time-table and get good results, no pecuniary damage will result. 3. We should require fuller knowledge of details to answer the third query.

V. S. (Nottingham).—The indentures must be extended as you suggest.

W. A. (Aberdeen).—We recommend Latin and French.

H. C. (Banbury).—Professor Darqué's Juxtalinear translation.

S. W. H. (Warwick).—The University Correspondence Class will make special arrangements with you.

D. G. (Workington).—It amounts only to 5 per cent. net, not 7½.

M. S. (Blackheath).—You will find a very good summary in Whitaker's Almanac.

I. U. (Portsmouth).—The Large hand is too sprawling and the long letters are not regulation length. The slants, too, are not parallel. Only about 70 per cent.

'SOUND' (Wellington).—The questions are not all of equal value.

D. L. J. (Scarborough).—Only in Wales.

W. P. (Gatehouse).—Kindly accept our best thanks. The mistakes are inexplicable.

S. Z. (Holborn).—You should commence to practice at once without a ruler, as none will be allowed.

J. J. J. (Smethwick).—1. Pitman's Phonography. 2. Key to Pitman's Phonography. 3. Wollman's 'Metric System Made Easy,' published by Joseph Hughes and Co.

'SMITH' (London).—We have neither time, nor space, nor inclination for practical jokes.

A. L. (Manchester).—1. There is no royal road to a Degree. 2. Enter Owen's College.

M. S. (Colchester).—Both Chester and York have city walls.

F. H. (Bickington).—1. We answered you more decidedly, but our letter was returned. 2. You will be heard at Scholarship Examination.

TRESKERBY (Exeter).—1. Not a desirable position. 2. You will be able to get the information from the General Post Office or any barracks.

'TALIS' (Jedburgh).—The *Strand Magazine* for March gives an interview with Professor Blackie.

'M. S. L. (Sheffield).—Euclid is not a failing subject. See our Scholarship article.

G. N. ('Timbuctoo').—You must arrange *at once* with H.M.I.

P. R. (Burnley).—See our February issue.

'SUBSCRIBER' (Bath).—We are sorry for two things—(1) that we have made any mistakes, (2) that you have the extreme presumption to make use of such a word as *absurd*. You will learn better after a little more experience.

'AGRICULTURE' (Leicester); M. B. (Chippenham); K. H. (Castleton).—Freeman's, price 2s. 6d., published by Royal Agricultural Society; Morton's Handbooks of the 'Farm Series', price 2s. each. The best are 'The Crops,' 'The Soil,' 'The Chemistry,' 'The Live Stock.' Stephen's 'Book of the Farm,' price £3, is an excellent one for reference purposes.

A. D. (Heapey).—We are afraid we cannot insert a special 'Notes of Lessons.' Draw one up and send it on with stamp, and we will correct it.

E. J. (Fratton); L. T. (Leighton Buzzard); C. W. B. (Southsea); J. N. (Edgbaston); R. W. K. (Congleton); S. S. (Coventry; P. L. (Manchester; P. M. (Ellenborough); J. H. (Swansea); J. L. J. (Eastbury); S. T. U. (Dublin); W. J. W. (Luton); E. D. (St. Blazey); H. A. (Aston); 'SMIFF' (Gloucester).—Have forwarded correct answers to P. T. algebraic question.

LETTERS ANSWERED BY ORDINARY POST.

A. E. A. (Ling's Lynn), V. W. (Durham), R. J. K. (Cork), J. D. (Luton), A. W. (Walmer), W. H. S. (Leamington), W. F. (Macclesfield), D. G. (Westbromwich), J. A. (Folkestone), L. H. (Dundee), E. A. R. (Chesham) two letters, E. E. M. (Leeds), J. J. (Canterbury), E. J. S. (Southfleet), H. E. C. (Hill Top), H. E. C. (Bromsgrove), WREKIN, W. D. E. (Aberystwyth), W. P. (Greenwich), W. W. (Fisherton), G. N. A. (Long Eaton), R. M. (Alnwick), J. W. B. (Perth), T. W. B. (Stone), T. F. (Exeter), W. J. W. (Fleet), W. H. T. P. (Southsea), F. H. (Bickington), L. H. (Burnley), E. J. S. (Stoneyford Road), M. T. B. (Paignton), T. P. T. O. (Stockport), H. D. (Lincoln), S. T. W. (Stalybridge), T. J. H. (Acton), L. T. (Leighton Buzzard), R. P. (Retford), H. R. (Yarmouth), H. A. (Gatefield), W. E. (Brixham), M. E. P. (East Grinstead), J. F. H. (Smallheath), A. G. (Stornoway), T. R. (Buxton), T. J. (Tonypandy), M. H. (Pickering), J. C. (Woolton), C. P. (Plymouth), O. L. D. (Windermere), W. S. (Tutbury), ANXIOUS ONE (Borth), B. C. (Stourbridge), J. W. (Ellenborough), H. J. (Connah's Quay).

PUBLICATIONS REVIEWED.

The Art of Teaching and Studying Languages. By François Gouin. London: George Philip and Son.

Everyone knows that in order to quickly acquire a sound knowledge of any foreign living language we should proceed as we did in the acquisition of our mother tongue. Yet hitherto, and for reasons too long to state here, nobody had the pluck to give the public a clear and philosophical exposition of the method. This feat has just been achieved by M. François Gouin, a Parisian professor. He has done more than that: he has demonstrated with mathematical accuracy the causes of the failure of every other method of teaching languages, and compared them with his own. We heartily wish success to the book, while we admire the able treatment it has received at the hands of the translators—Messrs. Howard Swan and Victor Bétis. The volume is very well got up.

The Smaller Cambridge Bible for Schools:

The Book of Joshua, with Introduction and Notes. By John Sutherland Black, M.A.

The Second Book of the Kings. By the Rev. J. Rawson Lumby, D.D.

The Gospel According to St. John. By the Rev. A. Plummer, M.A. London: C. J. Clay and Sons.

These neat and handy little text-books are admirable additions to a valuable series. The study of any one of them would be an excellent course of scriptural training during a term, or perhaps a longer period, for the elder boys and girls in middle-class and higher schools. The editors are men of ripe scholarship and approved ability, and their work in these small books should redound to their honour, because it brings the results of their own special and almost exhaustive study within the reach of the young minds of our time.

The introductions are concise and crammed with matter. The notes are very full and clear. A good map is prefixed to each volume.

While thoroughly commending the contents of these books, we ought not to overlook one drawback to their use. In order to comprise so much matter within such narrow limits, a small type has been employed, and the margin on each page is very slender. The print, it is true, is very clear for its size, as might have been expected from the University Press; but the type used in the Introductions, and more especially that in the notes to a Chronological Table prefixed to the Book of Kings, must prove very trying to young eyes.

About England; or, First Lessons in English Geography. By M. J. Barrington-Ward, M.A., F.R.G.S., F.L.S. London: George Bell and Sons.

It is a pleasure to read a book in which the ordinary facts of geography are presented with so much freshness and charm as one meets with in the pages before us. One could almost regard this as fulfilling one's ideal of a geographical reader, and wish that all children could obtain their knowledge of English geography through so agreeable a medium. Still, we hesitate about recommending it for general use, and for this reason: It seems to us that what is termed a 'condition precedent' is required, in order that readers may enjoy and duly profit by such a book. A certain degree of mental cultivation would seem to be necessary for the understanding and due appreciation of the lessons, and this 'condition precedent,' we are afraid, would not be found to exist in many of the children who reach the Third Standard of an elementary school. It is not that the vocabulary is too difficult, but we come frequently upon turns of expression that have too decided a literary cast to be readily seized by young children who come from bookless homes and illiterate parents, whose experience is of the narrowest, and whose imaginative faculty is but rudimentary. Such sentences as the following may illustrate our meaning: 'No single line of mountains have we here, but scattered peaks, that rise above a cluster of lovely lakes nestling far down amongst the valleys, and low, thick woods, from which the big, bare heights tower up towards the sky.' This pleasant collocation of simple words pictures ideas that would require a considerable amount of explanation before the children we have in mind would be able to realise them. So again in the pregnant chapter on 'the Chalk Rocks.' 'A few grains of chalk powder placed beneath a strong microscope, show for themselves their life history. Scraps of pretty little shells they are, broken and crushed it may be, yet shells without doubt.' These are but short sentences, but they afford only too much scope for necessary and far-reaching explanation, both as to matter and construction.

These considerations notwithstanding, we are, however, so much pleased with the book, that we can gladly recommend it for adoption in the better class of elementary schools, and we trust that the number likely to benefit by it may constantly increase. We can well understand with what delight the genuine teacher would accompany a class of children who had some taste of true culture through the chapters of this book.

The woodcuts which adorn the text, and the small maps inserted in the closing summary of facts, deserve a word of praise. The publishers have done their part also in recommending the work by a neat and pleasing appearance.

The Royal English History Readers. The Hanoverian Period. Standard VII. London and Edinburgh: T. Nelson and Sons.

Another of the many series of school-books issued from the house of Thomas Nelson is completed by the publication of this volume. The claim made on the title-page that it is 'a Reader and Text-book in one' is well borne out by its contents. The matter has been selected and compiled with sound judgment, and it is presented in a very agreeable manner. The lessons are abundantly illustrated with historical scenes, portraits of the sovereigns and eminent persons, maps of campaigns and battlefields, and poetical extracts. Among the poems inserted are Campbell's 'Battle of the Baltic' and 'Napoleon and the Sailor,' Byron's 'Stanzas on Waterloo,' Mrs. Browning's 'Victoria's Tears,' and Trench's 'Balaclava.'

At the end of the book the chapters are summarised, notes and meanings are added, and a copious list of dates is given. The whole concludes with a long series of short biographies.

Agriculture. By W. T. Lawrence. London: W. and R. Chambers.

This little work is written more especially for the elementary stage of the department's examination in agriculture. It, however, contains most of the matter absolutely essential to a pass in the advanced stage.

It is clearly printed, strongly and neatly bound, and contains a large number of analyses. After a careful examination, we can commend it to those requiring a book of the kind. The writer has evidently had much experience as a teacher of the subject.

ERROR PRIZE.

The answers to our Standard VII. Problems—our last supplement—were **ABSOLUTELY CORRECT**. Many correspondents have written to point out what they deemed errors, but in every case the answer printed was the right one.

We offer the usual prize in connection with our present supplement.

ANECDOTE PRIZE.

We are compelled to hold over this award until our next issue.

☞ **We have now the pleasure to publish the Judge's Awards in our Last Money Prize Writing Competition. The terms were as follows:—**

HUGHES'S

EXAMINATION COPY-BOOKS.

£10 MONEY-PRIZE £10

WRITING COMPETITION.

£4 for Boys; £4 for Girls; and £2 for the Teacher.

☞ **This Competition is restricted to the first four Standards.**

	BOYS. s.	d.		GIRLS. s.	d.
1st Prize in EACH Standard	10	0	..	10	0
2nd " " "	5	0	..	5	0
3rd " " "	3	0	..	3	0
4th " " "	2	0	..	2	0
	£1 0	0		£1 0	0

£2 will be given to the Teacher from whose school the best Writing (in all the four Standards) is sent.

Standard I. to write Nos. 1 and 2
" II. " " 2, 3 and 4
" III. " " 4, 5 and 6
" IV. " " 5, 6 and 7

HUGHES'S EXAMINATION COPY-BOOKS.

LIST OF PRIZE WINNERS TO WHOM THE PRIZES HAVE BEEN SENT:—

STANDARD I. BOYS:—FIRST PRIZE, 10s.—JOHN LONGSTAFF, Sutton Schools, Isle of Ely.
SECOND PRIZE, 5s.—FREDERICK JACKSON, The School, 38, Louis Street, Leeds.

STANDARD I. GIRLS:—FIRST PRIZE, 10s.—FLORENCE CHEATER, St. John's Girls' School, Portsea.
SECOND PRIZE, 5s.—F. BROWN, Seymour House School, Saltash, Cornwall.
THIRD PRIZE, 3s.—P. KING, Seymour House School, Saltash, Cornwall.
FOURTH PRIZE, 2s.—G. PEARCE, Seymour House School, Saltash, Cornwall.

STANDARD II. BOYS:—FIRST PRIZE, 10s.—ERNEST HADDER, Sutton Schools, Isle of Ely
SECOND PRIZE, 5s.—JOSEPH HADDOCK, Sutton Schools, Isle of Ely.
THIRD PRIZE, 3s.—CHARLES NUNN, Sutton Schools, Isle of Ely.
FOURTH PRIZE, 2s.—AUGUSTUS H. SUTTON, Sutton Schools, Isle of Ely.

STANDARD II. GIRLS:—FIRST PRIZE, 10s.—FLORENCE WOODHEAD, The School, 38, Louis Street, Leeds.
SECOND PRIZE, 5s.—C. DUFF, Seymour House School, Saltash.
THIRD PRIZE, 3s.—HANNAH BARNES, Sutton Schools, Isle of Ely.
FOURTH PRIZE, 2s.—EDITH MEEKS, Sutton Schools, Isle of Ely.

STANDARD III. BOYS:—FIRST PRIZE, 10s.—DOUGLAS MORGAN, Sutton Schools, Isle of Ely.
SECOND PRIZE, 5s.—GEORGE FEW, Sutton Schools, Isle of Ely.
THIRD PRIZE, 3s.—ARTHUR NEWMAN, Sutton Schools, Isle of Ely.

STANDARD III. GIRLS:—FIRST PRIZE, 10s.—M. HARRIS, Seymour House School, Saltash.
SECOND PRIZE, 5s.—F. MURLEY, St. John's Girls' School, Portsea.
THIRD PRIZE, 3s.—L. BONHAM, Seymour House School, Saltash.
FOURTH PRIZE, 2s.—C. PRIEST, Seymour House School, Saltash.

STANDARD IV. BOYS:—FIRST PRIZE, 10s.—ROBERT MODEN, Sutton Schools, Isle of Ely.
SECOND PRIZE, 5s.—CHARLES E. BOULTBEE, Sutton Schools, Isle of Ely.
THIRD PRIZE, 3s.—MONTY BLAKE, Sutton Schools, Isle of Ely.
FOURTH PRIZE, 2s.—PERCY MURRAY, The School, 38, Louis Street, Leeds.

STANDARD IV. GIRLS:—FIRST PRIZE, 10s.—B. HITCHINS, Seymour House School, Saltash.
SECOND PRIZE, 5s. FLORRIE BENNETT, Thorns Road School, S. Lambeth.
THIRD PRIZE, 3s.—ROSE HINKS, St. John's Girls' School, Portsea.
FOURTH PRIZE, 2s.—N. CLARK, Seymour House School, Saltash.

TEACHER'S PRIZE, £2.—JOHN TAYLOR, ESQ., Head Master, Sutton Schools, Isle of Ely.

BRITISH MUSEUM 25 JU 92

THE ELEVENTH EDITION, REVISED AND CORRECTED, IS NOW READY.

FIRST YEAR OF SCIENTIFIC KNOWLEDGE

BY PAUL BERT.

550 ILLUSTRATIONS. CLOTH. PRICE 2s. 6d.

This book has been written for the purpose of giving Elementary Instruction in Physics and Natural Science; it is divided into Seven Parts, viz.:—

1. Animals
2. Plants
3. Stones and Soils
4. Physics
5. Chemistry
6. Animal Physiology
7. Vegetable Physiology

Sir JOHN LUBBOCK, Bart., M.P., D.C.L., F.R.S.—'I have no hesitation in strongly recommending M. Paul Bert's "First Year of Scientific Knowledge." I only wish it were used in all our schools.'

'This admirable little book might well be made the subject of a discourse on the teaching of the natural knowledge . . . it ought most certainly to be in the hands of every parent of young children; its manner, as much as its matter, demands this.'—*Athenæum.*

One of H.M.'s Inspectors says—'It is so admirable a work that it ought to be in every teacher's hands.'

Paul Bert's 'First Year of Scientific Knowledge' was mentioned at the Annual Conference of the Association of Head Mistresses of Endowed and Proprietary Schools, held at Egbaston, as the Text Book used in Schools connected with the Association.

'One of the best little outlines of science for children. . . . No better work could possibly be found for use in home tuition.' *Illustrated London News.*

70,000 of the English Edition, and One Million Copies of the French Edition, have been sold.

RELFE BROTHERS,

Educational Publishers and Booksellers and General School Stationers,

6, CHARTERHOUSE BUILDINGS, ALDERSGATE, E.C.

Recently Published by W. & R. CHAMBERS.

PHYSIOGRAPHY. Elementary Course. Adapted to the Syllabus of the South Kensington Science Department. By the late ANDREW FINDLATER, M.A., LL.D. New Edition by DAVID FORSYTH, M.A., D.Sc., Principal, Higher Grade School, Leeds. Price 2s.

AGRICULTURE. Elementary Course. Adapted to the Syllabus of the South Kensington Science Department. By WILLIAM T. LAWRENCE, Teacher of the Principles of Agriculture, Hereford. Price 2s.

BOOKS for NEW REQUIREMENTS of the CODE.

SHORT EXERCISES IN MENTAL ARITHMETIC. These Exercises are so numerous and comprehensive as to include all possible phases of questions that may be proposed.
STANDARDS I., II., III. ... ... Price 10d.
,, IV., V., VI., VII. ... ... Price 10d.
Also in separate Standards, I. to V., 4d. each; V. and VI., combined, 4d.

CHAMBERS'S NEW CODE ARITHMETICAL TESTS for Boys and Girls, with Questions in the ordinary Rules and in Decimal Notation, Decimal Coinage, and the Metric System. 40 Cards in each Standard, and two copies of Answers, in cloth cases. Standards IV. to VII. By T. B. ELLERY. Price 1s. each.

COURSE OF ARITHMETIC. By T. B. ELLERY, F.R.G.S. New Edition, 1891 Code. With Notation of Decimal Fractions, Decimal Coinage, Metric System, and New Examination Test.

STANDARDS I., II. ...	2d.	STANDARD V.	3d.
STANDARD III.	2d.	STANDARD VI.	3d.
STANDARD IV.	2d.	STANDARD VII.	3d.

PROBLEMS IN ARITHMETIC. By T. B. ELLERY. For Standards II. to VII. Part I., 1½d.; II., 1½d.; III., 2d. ANSWERS, 2d. In one volume, cloth, without Answers, 6d.

CHAMBERS'S MENSURATION. Stage I., for the Specific Subject and for Pupil Teachers, with Answers. Price 6d.

DECIMAL COINAGE AND THE METRIC SYSTEM, in Theory and Practice, for Standards V. to VII. With Rules, Numerous Examples, Exercises, and Examination Tests. By T. B. ELLERY. Price 4d.

CHART OF THE METRIC SYSTEM, 44 by 29 inches, giving Tables of Money, and Measures of Length, Surface, Solidity, Capacity, and Weight. Price 8d. in a Sheet: 3s. on Roller; 5s. on Roller and Varnished.

CHAMBERS'S SPELLING TEACHER AND MANUAL OF DICTATION, containing Classified Lists of Works, and Exercises framed on these lists, so as to teach correct spelling from the actual use of words. Price 1s. 6d.

CHAMBERS'S SPELLING MANUAL, being Classified Lists of Words from the SPELLING TEACHER printed separately. Price 4d.

UNSEEN DICTATION. DICTATION TESTS for Standard IV., graduated in difficulty. By an Inspector of Schools. Price 6d.

TOPICS FOR LESSONS IN ELEMENTARY SCIENCE. New Code, 1891. Being Thirty Object Lessons for Standard I. and Thirty Object Lessons for Standard II., on common objects and substances employed in ordinary life. By T. P. SYKES, Head Master, Great Horton Board School, Bradford. Price 10d.

W. & R. CHAMBERS, Limited, 47, Paternoster Row, London; and Edinburgh.

☞ **INDISPENSABLE TO SCHOLARSHIP CANDIDATES.**

Now Ready. Demy 8vo, Extra Cloth. Price 2s.

LA JEUNE SIBÉRIENNE

(Xavier de Maistre):

A JUXTALINEAR TRANSLATION with NOTES

By F. É. DARQUÉ,

For sixteen years Principal French Master, Dulwich College
(*Author of 'Pupil Teachers' French Course'*).

Specimen Copy, post free, upon receipt of P.O. 1s. 6d.

NOW READY.

HANDSOMELY BOUND IN EXTRA CLOTH GILT.

PRICE **12s.**

VOLUME XII.

OF THE

"PRACTICAL TEACHER,"

ALL SUPPLEMENTS INCLUDED.

Sent Carriage Paid direct to any Teacher upon receipt of P.O. for 9s.

☞ *Early application should be made, as the number of copies offered for sale is limited.*

CASES FOR BINDING, PRICE 2s.; POST FREE, 1s. 6d.

London: JOSEPH HUGHES & Co., Pilgrim St., Ludgate Hill, E.C.

CIVIL SERVICE EXAMINATIONS

For appointments under Government; 1,500 vacancies annually. Open to Males and Females. Age from 15 to 30. Commencing Salaries, £55—£250. Clerkships, Excise, Customs, Telegraphists, Cadets, Engineer Students, &c. Special Morning Class for both sexes. Separate Class-rooms. 550 Passes. Tuition also by correspondence for country candidates. The most successful system extant. *Full information free.*

J. KEEFE, F.R.G.S., &c., 63, BOLD ST., LIVERPOOL.

"The PARAGON" SCHOOL SLATE

bears all bad usage unruffled.'

Supplied direct from the Makers,

WALKINGTON & CO.,

HOPE STREET, LEEDS.

London Agents: Messrs. WAKE & DEAN, 111, London Road, S.E.

W. & Co.'s Ink Powder deserves an EARLY TRIAL.

MACNAMARA'S LIST. See Notes and Notions in 'Practical Teacher' (April). Many of the words in this list, together with 22 Recitations, Tables, Map of England, Sums and Problems, Drawing Copies, are in The Scholar's Assistant for Standards I. III. Specimen Gratis and Post Free, or 9d. per Dozen, from S. MEAD, 31, NEWTON ROAD, FAVERSHAM.

KINDERGARTEN.

A trained and highly efficient Kindergarten Mistress gives lessons by Correspondence. Clear and concise Papers on every 'Occupation.' Invaluable Notes on Ling's Swedish Drill. A boon to any Mistress. Terms low. References.—Mistress, 4, Union Terrace, Notting Hill, London.

CERTIFICATE MATHEMATICS

WHY FAIL?

FIRST OR SECOND YEAR'S COURSE IN 14 WEEKS.

SCHOLARSHIP (Males and Females) } *All Subjects.*
CERTIFICATE (Females) }

NO FAILURE LAST DECEMBER.

Low Fees. Prospectus free.

'TUTOR,' KIDSGROVE, STOKE-ON-TRENT.

SALE AND EXCHANGE COLUMN.

FOR SALE—Vol. XII. 'Practical Teacher.' (unbound). Livesey's 'Notes of Lessons,' 2s. 6d. Livesey's 'How to Teach Arithmetic,' 2s. 6d. Livesey's 'How to Teach Reading,' 1s. 6d. Livesey's 'How to Teach Grammar,' 2s. 'Notes on School Management,' by G. Collins, 2s. 6d. Gladman's 'School Method,' 2s. 6d. Moffatt's 'P.T.'s Course for First Year,' 4s.; Second Year, 5s. 'Pupil Teacher's Handbook,' by A. Park, 9d. 'How to Earn the Drawing Grants,' 4s. 6d. 'The Earth and the Solar System,' by T. Page, 1s. 'Chambers's British History,' 2s. 6d. (All quite new). What offers for all, or part? Apply—J. Gaskell, 25, Fleet Street, Pemberton, near Wigan.

The Practical Teacher.

A MONTHLY EDUCATIONAL JOURNAL.

To Subscribers.—Subscribers not receiving their copies regularly are respectfully requested to write to the Publisher.

It would save time and expense if subscribers when remitting would state exactly what numbers they wish to be sent.

To Correspondents.—All literary communications should be addressed, THE EDITOR OF THE PRACTICAL TEACHER, Pilgrim Street, Ludgate Hill, London, E.C.

☞ The Editor cannot upon any consideration return unsolicited MSS. Authors should therefore retain copies.

SCALE OF CHARGES FOR ADVERTISEMENTS.

For an ordinary page	4 guineas.
For page facing matter	5 guineas.
For 2nd page of wrapper	5 guineas.
For 3rd page of wrapper	5 guineas.
For the page opposite the 3rd page of wrapper	5 guineas.
For the 4th (back) page of wapper	6 guineas.

Parts of a page are charged at a slightly higher rate.—Special quotations will be given for a series of three, six, or twelve months.

Carlyon College.

KERIN and LYNAM, 57 and 58, Chancery Lane.

LONDON UNIVERSITY

MATRICULATION, INTER. ARTS, INTER. SC., PREL. SCI. & B.A.

Afternoon and Evening Classes are now formed.

Inter. Arts, Inter. Sc., Prel. Sci. Revision Classes commence June 26th.

SPECIAL B.A. CLASS FOR LADIES.

Specially compiled papers set each week are done and corrected out of class.

LEGAL AND MEDICAL PRELIMINARIES, UNIVERSITY AND HOSPITAL SCHOLARSHIPS, INDIAN AND COLONIAL SERVICES, ROYAL UNIVERSITY IRELAND.

PROSPECTUS, etc., ON APPLICATION.

Under the direction of R. C. B. KERIN, B.A. Lond., first in First Class Classical Honours at Final, Editor of 'Phaedo' and 'Pro Plancio'; and J. D. LYNAM, M.A., Honoursman in Mathematics and Modern Languages, Author of 'Short Notes on B.A. Mathematics'; assisted by First Class Honoursmen.

FIRST EXAMINATION OF OUR STUDENTS:—

B.A., Lond., 1891, 5 competed, 3 successful; Matriculation, Lond., Jan., 1892, 8 competed, 7 successful.

The Principals may be seen any day between 11 and 1 a.m. (except on Thursday), and 2.30 to 6 p.m., or by appointment.

J. JENNINGS & CO.,

TUITION BY CORRESPONDENCE,

DEPTFORD, S.E.

ESTABLISHED 1871.

Classes now forming for :—

Certificate	Matriculation
Scholarship	Languages
Sciences	Script Shorthand
Drawing	Special Subjects

FEES QUARTERLY. Reduction if paid in Advance.

PUPILS MAY JOIN AT ANY TIME.

ENCLOSE STAMP FOR PROSPECTUS AND FULL PARTICULARS.

CERTIFICATE EXAM.

(1st or 2nd Year.)

SCHOLARSHIP EXAM.

HIGHLY SUCCESSFUL COACHING BY CORRESPONDENCE.

No fees unless successful first time. Backward students *made* to pass. Exceptionally low terms. Addressed envelope for particulars, list of successes, &c., GEORGE HENRY SPARROW, Forest Gate, London, E.

N.B.—Teachers who intend taking Papers are invited to communicate at an early date with Mr. Sparrow. The work for these Exams. having been the speciality for the past eight years, with increasing success each year, there is little fear of failure now. Dull students are got through safely, and bright ones pushed into First Division.

The increasing demands of each year's Exam. should warn candidates to engage a Coach, making a *speciality* of his or her requirements.

YOUNG LADIES who want to be INDEPENDENT and make their way in the world should Write for Prospectus of the Scientific Dress Cutting Association, 272, Regent Street, London, W.. Situations found for all pupils at good salaries. No Lady's education is complete without a knowledge of Dressmaking.

GRATEFUL—COMFORTING.

EPPS'S COCOA.

BREAKFAST.

'By a thorough knowledge of the natural laws which govern the operations of digestion and nutrition, and by a careful application of the fine properties of well-selected Cocoa, Mr. Epps has provided our breakfast tables with a delicately flavoured beverage which may save us many heavy doctors' bills. It is by the judicious use of such articles of diet that a constitution may be gradually built up until strong enough to resist every tendency to disease. Hundreds of subtle maladies are floating around us ready to attack wherever there is a weak point. We may escape many a fatal shaft by keeping ourselves well fortified with pure blood and a properly nourished frame.'—*Civil Service Gazette.*

Made simply with boiling water or milk. Sold only in Packets, by Grocers, labelled thus:

JAMES EPPS & Co., Homœopathic Chemists, London.

NOW COMPLETE.

WESTMINSTER READING BOOKS

AN ENTIRELY NEW SERIES.

ALL THESE BOOKS HAVE JUST BEEN ADOPTED BY THE LONDON SCHOOL BOARD.

THE SPECIAL FEATURES ARE:—

1. *New and Interesting Lessons both in Prose and in Poetry.*
2. *Careful Graduation both in the difficulties of language and in subject-matter.*
3. *Lists of Words for Spelling, Notes, and Explanations of Words and Phrases.*
4. *Grammar Lessons to meet the various schemes set forth in the New Code, and a progressive series of Grammar Exercises.*
5. *Excellence in Type, Illustrations, Paper, and Binding.*

FIRST PRIMER,	32 pp.,	cloth boards,	3d.
SECOND PRIMER,	48 pp.,	,, ,,	4d.
INFANT READER,	84 pp.,	,, ,,	5d.
STANDARD I.,	128 pp.,	,, ,,	8d.
STANDARD II.,	144 pp.,	,, ,,	9d.
STANDARD III.,	125 pp.,	cloth boards,	1s. 0d.
STANDARD IV.,	200 pp.,	,, ,,	1s. 3d.
STANDARD V.,	210 pp.,	,, ,,	1s. 4d.
STANDARD VI.,	216 pp.,	,, ,,	1s. 6d.

NOTE.—**Specimens will be sent to Head Teachers on application.**

The 'TEACHER'S AID' says of these books:—

'These new candidates for public favour are as near perfection as can possibly be. They are boldly printed, strongly bound, well graduated, and nicely illustrated, while the extracts are admirably selected from many and varied sources, some of them being absolutely novel, and all fresh and attractive. Every necessary "aid" both to scholar and teacher, is given, the result being a set that will be difficult to equal and impossible to excel. They will be sure to become highly popular with both pupil and teacher. We know of no better set in the "reader" market.'

HISTORY AS A CLASS SUBJECT.

WESTMINSTER HISTORICAL READING BOOKS.

By CHARLOTTE M. YONGE.

Author of 'The Heir of Redclyffe,' 'Cameos from English History,' etc.

Part I. (Standard I. and II.), Simple Stories relating to English History. 120 pp. cloth boards, 9d.
Part II. (Standard III.), Twelve Stories from Early English History. 168 pp. cloth boards, 1s.
Part III. (Standard IV.), Twenty Stories and Biographies from 1066 to 1485. 220 pp. cloth boards, 1s. 3d.
Part IV. (Standard V.), The Tudor Period, with Biographies of Leading Persons. 226 pp. cloth boards, 1s. 8d.
Part V. (Standard VI.), The Stuart Period, especially the Civil War, and the Constitution and Functions of Parliament. 236 pp., cloth boards, 1s. 8d.
Part VI. (Standard VII.), The Hanoverian Period, with special reference to the Colonies and Foreign Possessions of Great Britain. 256 pp., cloth boards, 2s.

Specimens will be sent to Head Teachers on application.

NATIONAL SOCIETY'S DEPOSITORY, SANCTUARY, WESTMINSTER.

DAY TRAINING COLLEGE,

WHITE STREET, MOORFIELDS, E.C.

Approved by the Education Department, and Recommended by Her Majesty's Inspectors.

PRINCIPAL - - PROFESSOR CUSACK.

SCHOLARSHIP, 1893.

New Course (Saturday Classes) begins 9th of July. New Course (Evening Classes) begins 12th of July. To secure admission immediate application is necessary. In July, '91, the Classes filled to overflowing on the opening day. Seats will now be reserved for Students strictly in the order in which applications are received.

CORRESPONDENCE CLASSES.

First sets of papers will be sent out 6th of July. Names should be sent in at once, and text-books, &c., provided, so as to be able to begin work on the day named. **SUCCESS IS GUARANTEED** to all who begin with the Course. **SCIENCE, DRAWING, and LANGUAGES** are included in the Course without any extra fee.

At Scholarship Examination, July, '91,

343

Students of this College were successful, of whom **153** were in the First Class. Highest position attained was No. 12 on Scholarship List, but several were within the first 100 on list.

At Certificate Examination, December, '91,

327

Students of this College were successful, including every candidate presented in Second Year, Females Section. Four times in succession all the candidates presented in Second Year, Males Section, were successful.

At Science and Art Exams., 1891, over

500

Students of this College were successful. Of all who then passed in Freehand and Perspective, ONE IN EVERY SIX OBTAINED A PRIZE from the Science and Art Department.

Prizes of 25 guineas, 20 guineas, 5 guineas and several prizes of 1 guinea, and half-a-guinea each, are offered for competition among the Students in the 1893 Scholarship Classes.

Intending Students, Head Teachers, and Managers are invited to call any Saturday and see classes now at work. Prospectus and full particulars are now ready, and will be sent post free to any applicant. All applications to be addressed to

PROFESSOR CUSACK.

Adopted in London and Provincial (Board and Voluntary) Pupil Teachers' Centre Schools and Classes.
Third Edition. Crown 8vo. 200 pp. Price 2s.

PROFESSOR DARQUÉ'S

PUPIL TEACHERS' FRENCH COURSE.

By F. E. DARQUÉ, *for Sixteen Years Principal French Master, Dulwich College.*

☞ **Every Question set at the last Scholarship Examination could have been answered perfectly by any Student who had used Prof. Darqué's book.**

The 'LITERARY WORLD' says:—'At last we have the pleasure of welcoming a French Course constructed on rational principles; a course, *i.e.*, which attempts to teach not mere grammar, but the every-day language of Educated French people. Prof. Darqué, after thirty-five years' experience as French Master, justly ridicules the absurd methods of teaching foreign languages commonly in vogue in England. The Exercise System as generally used, the study of the poetry and prose of past centuries, and the concentrating at the outset of the whole of the mental faculties on the study of Grammar, are all condemned as inadequate means to the end in view—namely, that one may readily convey one's thoughts to French-speaking people and understand theirs. Prof. Darqué begins by teaching his pupils a few common-place sentences, and then exercises their understanding by means of question and answer. In his course, the first dose of French administered to the student consists of the interrogative pronouns most commonly employed, and a number of short sentences illustrating their use. We notice also that in the early exercises a good number of French words are used that are identical with, or very like, the corresponding English words, thereby giving the pupil useful and encouraging ideas of the kinship of the languages.'

The PROFESSOR of LITERATURE at the Lycée, Versailles, writes:—'Le plan général de l'ouvrage me paraît excellent; enseigner par la pratique plutôt que par la théorie me paraît la voie la plus rapide et la meilleure.'

☞ **Her Majesty's Inspectors have in all parts of the Country freely testified to the excellence of Prof. Darqué's French Course, especially as to its fitness for Pupil Teachers' use.**

ADOPTED IN TRAINING COLLEGES AND PUPIL TEACHERS' CENTRE CLASSES.
Third Edition. Crown 8vo. 160 pp. Price 1s. 6d.

ESSAYS, ESSAY WRITING, AND PARAPHRASING.

Being Models and Hints for Pupil Teachers, Scholarship Candidates and Students.

By C. J. DAWSON, B.A. (Lond.),

Head-Master under the London School Board; formerly President of the National Union of Teachers.

The 'TEACHERS' AID' says:—'Mr. Dawson has put into this book a labour of love and much literary taste and knowledge. The Publisher presents the result in a dainty dress, far superior to the common run of Eighteenpenny Manuals. The Model Essays are praiseworthy for feeling, matter, and style; and the thirty pages allotted to paraphrasing supply a want in a very creditable manner.'

The 'SCHOOLMASTER' says:—'The book takes a wide view of the subject, combining principles with practice in a particularly instructive manner. The results of large reading are laid before the student for his guidance in original composition; and Mr. Dawson's style is well worthy of careful observation and imitation till the learner has formed one of his own . . . The book can be strongly recommended to the student of English Composition.'

The 'CIVIL SERVICE GAZETTE' says:—'Must be of permanent value to all who use it as their text-book.'

LONDON: JOSEPH HUGHES AND CO., PILGRIM STREET, LUDGATE HILL, E.C.

AN ABSOLUTELY GUARANTEED INSURANCE.

NOT LIMITED TO ONE CLAIM.

SPECIALLY GUARANTEED BY THE

OCEAN ACCIDENT AND GUARANTEE CORPORATION, LIMITED.

Empowered by The Ocean Accident and Guarantee Company, Limited, Act, 1890.

Head Office:

MANSION HOUSE BUILDINGS, LONDON, E.C.

ONE THOUSAND POUNDS

Will be paid to the legal representative of any purchaser of

The Practical Teacher

killed in an accident occurring within the United Kingdom to a Railway Train in which he or she may be travelling as an ordinary passenger.

FIVE HUNDRED POUNDS

Will be paid to the legal representative of any purchaser of THE PRACTICAL TEACHER killed in an accident occurring within the United Kingdom to a Licensed Public Conveyance, not a Railway Train, in which he or she may be travelling as an ordinary passenger.

FIVE HUNDRED POUNDS

Will be paid to the legal representative of any School Teacher, a purchaser of THE PRACTICAL TEACHER, killed in an accident occurring within the United Kingdom while engaged in his or her school duties on school premises.

PROVIDED, that at the time of such accident this Coupon, with his or her usual signature, written in ink on the space provided below, attached to the copy of THE PRACTICAL TEACHER for the current month, was found upon the person so killed or among his or her possessions. Death must occur within twenty-four hours of the accident, and application for payment of the Insurance money must be made to the OCEAN ACCIDENT AND GUARANTEE CORPORATION, LIMITED, MANSION HOUSE BUILDINGS, LONDON, E.C., within fourteen days of its occurrence.

This Insurance holds good for the current month of issue only, and entitles the holder to the benefits of, and is subject to the terms and conditions of the above-named Act.

Signature.

Coupon available from June 24th to July 23rd, 1892.

This insurance is limited to one Coupon for each holder.

☞ **Adopted in Training Colleges and at P.T. Centre Schools.**

FOR PUPIL TEACHERS, SCHOLARSHIP, CERTIFICATE, AND MATRICULATION STUDENTS.

Now Ready. Crown 8vo. 640 pp. Price 3s. 6d.

DESCRIPTIVE GEOGRAPHY.

A TEXT-BOOK

PROFUSELY ILLUSTRATED

WITH

ORIGINAL MAPS, DIAGRAMS, etc., etc.

With an APPENDIX OF EXAMINATION QUESTIONS.

BY SAMUEL BROOK,

Head Master of the Senior Practising Schools, Westminster Training College.

OPINIONS.

The Schoolmaster says:—'A Text-Book on Geography is not attractive simply because it is new. The increased attention now given to the subject has tempted many mere compilers to issue manuals; indeed, their name is legion. Mr. Brook's work, however, is the outcome of long and successful experience as the Headmaster of the Practising School connected with the Westminster Training College, and can be commended with confidence to 'Pupil Teachers, and Scholarship, Certificate, and Matriculation Candidates,' for whom it is specially prepared. It is equally suited to any Student who desires to secure a general knowledge of the World, and particularly of the British Empire, the description of which occupies fully half of this large volume. Each country is, as it were, approached from the sea; the coast is fully surveyed; the interior, physical features (mountains, rivers, etc.), are described in order; the resources, industries, and commerce are explained; provinces, important towns, and historical sites are similarly noted; foreign possessions are enumerated; and the character of the inhabitants, their religion, and their form of government are separately indicated. More than six hundred pages of well-selected information, admirably arranged for the learner's eyes, good type, good paper, good binding, with sketch-maps, and diagrams, at a remarkably low price—this book will be in great demand by those for whom it is intended. A few pages of suggestive questions and a full index of about two thousand names form two valuable appendices.'

From an INSPECTOR'S ASSISTANT.—'It is a thoroughly practical work by a practical man; matter, style, print, and maps are everything that can be desired, and the diagrams cannot fail to be very helpful to the student.'

From H. E. HULL, Esq., Head Teacher, Hackney P.T. Centre, London School Board.—'I have examined it, and consider it excellent. Mr. BROOK and his Publisher may be proud of such an admirable book.'

From H. HANFORD, Esq., Little London Board School, Willenhall.—'I shall recommend it to the students of my Scholarship and Certificate Classes.'

From the Principal Midland Scholarship and Certificate Centre.—'We consider it a decided step forward in the treatment of its subject, and it should have a large sale. We shall place it on our list.'

From Mr. G. H. SPARROW, Scholarship and Correspondence Classes.—'I shall not fail to recommend it.'

From Mr. E. PRIESTLEY, Head Master, Kendrick Middle School, Reading.—'It certainly is the best in the market, and should have an enormous sale.'

From Mr. J. W. RYMER, B.A., Head Master, Wesleyan School, Barnsley.—'Mr. Brook's "Descriptive Geography" is sure to be a favourite wherever known. It is exceedingly interesting in style and matter, as well as attractive in appearance; it renders the study of geography alike easy and pleasant, and its information is up to date.'

From Mr. ED. A. MILLS, Scholarship and Certificate Coach, Croydon.—'It certainly deserves the name of "Descriptive." I do not know any general geography that so fully describes towns and coasts as this does. The geography of Africa is particularly good.'

LONDON:

JOSEPH HUGHES & Co., Pilgrim Street, Ludgate Hill, E.C.

NOW READY, PRICE **1s.**

Adopted at People's Palace, the Polytechnic, Goldsmith's Institute, &c.

FAMILY COOKERY.

By Mrs. E. A. SHARMAN.

First Class Diplomée, National Training School for Cookery; Lecturer to the National Health Society.

The Methodist Recorder says:—'The work of an expert. A feature of the book is the exclusion of expensive materials, and the constant consideration of the essentials—simplicity and economy.'

The Evening News and Post says:—'Practical Cookery Books are not so common that the prudent housewife can afford to neglect such a one as this. Mrs. Sharman has compressed into a book, small enough to be carried in the apron pocket, practical recipes for the concoction of cakes, soups, jellies, and the thousand and one dainties that tend to enhance the attractiveness of the family table. All the items in the book are quite compatible with the humblest of purses, and all are suitable for inclusion in a plain, healthy diet.'

The Star says:—'"Family Cookery," by Mrs. E. A. Sharman, is the book you want.'

ADOPTED BY THE LEADING SCHOOL BOARDS.

In **4** *sets of* **40** *Cards each (cloth cases). Prices* **2s.** *per set.*

HUGHES'S KINDERGARTEN DRAWING CARDS FOR INFANTS.

Set I.—Vertical and horizontal lines.
Set II.—The lines of Set I. with oblique lines forming angles of 45°.
Set III.—The lines of Sets I. and II. with oblique lines forming any angles.
Set IV.—For Standard I., in INFANT SCHOOLS.

ADVANTAGES.

1. They embody the true Kindergarten principle of Step by Step teaching.
2. Perfect Graduation. To ensure the transition from the Easy to the Difficult, each packet consists of 40 Cards.
3. One pattern leads into, and follows from another.
4. No previous knowledge of drawing by the teacher is necessary.

The Schoolmaster says:—'We have nothing but praise for these Cards, which give us some of the most useful patterns, and will be invaluable to teachers who, after the pattern has been drawn on Kindergarten slates, will then give them as freehand followed by drawing with rules.'

London: JOSEPH HUGHES AND Co., Pilgrim Street, Ludgate Hill, E.C.

Adopted in Training Colleges and at P. T. Centre Schools.

NOW READY Cr. 8vo. PRICE **2s. 6d.**

PRACTICAL KINDERGARTEN LESSONS.

For ENGLISH INFANT SCHOOLS.

By Mrs. MORTIMER

(Lecturer on the Kindergarten at the Home and Colonial Training College).

☞ **This treatise—which is exhaustively illustrated—is the only one extant which tells an elementary teacher in simple language how to introduce the Kindergarten into English Schools.**

The Morning Post says:—'Should pave the way to a more universal adoption of the Kindergarten system of teaching in English Infant Schools. "Practical Kindergarten Lessons" contains all the necessary information to enable a young instructor to master the elementary difficulties; and gives much encouragement to those who are endeavouring to teach on the lines laid down by Fröbel, whose object in life was to make learning a pleasure to children.'

The Schoolmaster says:—'We cordially commend the work to Infant Teachers; it contains much valuable information on the subject.

The School Guardian says:—'It will, no doubt, do the good work of brightening up a good many Infants' Schools in out-of-the-way places.'

The Teachers' Aid says:—'The ideas are suitably and tersely expressed; and the book certainly merits its title of practical.'

The Methodist Recorder says:—She shows very clearly how, step by step, the various gifts may be made the means of imparting a very extensive knowledge of form, colour, number, &c. The book has numerous original illustrations.'

The Daily Chronicle says:—'The method of employing these (the gifts), in teaching little children, is dealt with in a series of simple and practical lessons, admirably illustrated by a large number of plates and sketches. By means of these gifts, children can learn many things in an easy, pleasant fashion; to them it becomes not work, but play.'

The Evening News and Post says:—'So good are the illustrations, that they explain themselves without the aid of the explanatory matter.'

GIRLS' DOMESTIC ECONOMY.

Stage I., Price 3d.; Stage II., Price 4d.

Based on Hughes's Teachers' Domestic Economy.

EDITED BY MRS. BEACH.

WITH SUMMARIES, EXAMINATION QUESTIONS, &c.

LONDON: JOSEPH HUGHES & CO., PILGRIM STREET, LUDGATE HILL, E.C.

HUGHES'S

EXAMINATION COPY-BOOKS.

10 BOOKS. 2d. EACH.

Being two books for each of the first Four Standards, and two books for use in Standards V., VI. and VII.

REASONS FOR ADOPTING THE SERIES:—

1. CHILDREN CANNOT COPY THEIR OWN WRITING.
2. Guide lines abound in earlier books.
3. No overlapping of letters.
4. Perfect capitals without flourishes.
5. Bold round running hand ensured.
6. Entirely new arrangement of matter.
7. Every page an Examination Paper.
8. Best books to show the Inspector.
9. Quality of paper excellent.
10. Shape of book convenient.

CONTENTS.

FOR STANDARD I.

Presented with the JULY Number of the 'PRACTICAL TEACHER,'

ARITHMETICAL TEST CARDS.

STANDARD III.

Card 1.

1. How many times is twenty-nine contained in 549,405?

2. From two hundred and one pounds two shillings and a penny farthing take eighteen shillings and fourpence three-farthings.

3. £8 14s. 9¼d. + £67 9s. 8½d. + £374 18s. 10¾d. + £90 6s. 11½d. + £450 17s. 6d. + £6 15s. 7¾d.

4. What had I left out of five pounds after spending a guinea, half-a-guinea, a crown, half-a-crown, a florin, a shilling, and a penny?

Card 2.

1. What is the sum of £28 16s. 9¾d., £74 18s. 7d., £395 11s. 5½d., £817 15s. 8¾d., £5,736 12s. 4½d., and £1,939 13s. 6¼d.?

2. Divide one hundred and eight thousand and twenty by fifty-five.

3. Take nine thousand and seven pounds eighteen shillings and sixpence three-farthings from sixty-nine thousand and five pounds and a halfpenny.

4. How many pages will be filled by 47,472 words, if there are 8 words in a line and 23 lines on a page?

Card 3.

1. From £40,207 14s. 7¾d. take £34,079 18s. 10¼d.

2. Add together four thousand three hundred and eight pounds seventeen shillings and ninepence three-farthings, one pound twelve shillings and sixpence, seventy pounds seven shillings and a halfpenny, ninety-three thousand seven hundred and eighty-six pounds eighteen shillings and ninepence farthing, thirty-eight pounds sixteen shillings and tenpence three-farthings, nine thousand three hundred and seventeen pounds fourteen shillings and elevenpence halfpenny, and three hundred and sixty-eight pounds sixteen shillings and fourpence three-farthings.

3. A boy had one thousand and ninety marbles. He gave fifty-nine to each of his seventeen playmates. How many had he left for himself?

4. Divide three million three hundred and three by 156.

Card 4.

1. A gentleman had £3,000. He bought a house for £876 10s., and land for £329 17s. 6d. How much had he left?

2. Find the sum of £470 15s. 9¾d., £3,087 18s. 11½d., £26,005 13s. 10¼d., £9 17s. 9¾d., £89 16s. 5d., and £5,108 10s. 3¼d.

3. What is the quotient when the divisor is two hundred and five and dividend six hundred and thirty-nine thousand six hundred?

4. How much must be added to £69,027 16s. 2¾d., to make £360,000 7s. 1½d.?

Card 5.

1. How many times is seventy-six contained in 72,352?

2. What is the difference between eleven thousand six hundred and thirty-four pounds three shillings and eightpence three-farthings, and nine hundred and nine pounds fourteen shillings and ninepence farthing?

3. A carriage is worth £19 7s. 6d., and the horse is worth £3 15s. more than the carriage. How much are they worth together?

4. £390 18s. 7¼d. + ten thousand and twenty-eight pounds thirteen shillings and ninepence halfpenny + £86 15s. 10¾d. + four hundred and eighty pounds four shillings and three halfpence + £17 19s. 9¼d. + three thousand and five pounds seventeen shillings and elevenpence three-farthings.

Card 6.

1. £804,084 17s. 6¼d. − £80,408 17s. 8¾d.

2. What number must be multiplied by 304 to get the same answer as 1,392 multiplied by 323?

3. What is the sum of £6,017 12s. 4¾d., £102 7s. 8d., £15,408 10s. 11½d., £206 5s. 2d., £40 18s. 6¼d., and £70,005 14s. 10¾d.?

4. Divide eight hundred and eighteen thousand six hundred and twenty by seventy-nine.

Card 7.

1. The quotient is 85, the remainder 86, and the divisor 87. What is the dividend?

2. What is the amount of £489 17s. 6d., 10 guineas, 17 half-sovereigns, 9 crowns, 5 half-crowns, and 7 florins?

3. Find the eight hundred and twelfth part of four hundred and seventy-nine thousand and eighty.

4. Take eight hundred and ninety pounds seven shillings and sixpence farthing from two thousand and four pounds.

Card 8.

1. Add together three hundred and nine pounds eighteen shillings and sevenpence halfpenny, six thousand and ninety pounds fourteen shillings and elevenpence, forty-seven pounds nineteen shillings and eightpence three-farthings, nine pounds seventeen shillings and fivepence halfpenny, eight thousand seven hundred and sixty pounds thirteen shillings and tenpence farthing, and sixteen shillings and tenpence halfpenny.

2. What is the difference between eighty-seven thousand and eighteen pounds and elevenpence and half-a-million pounds and sixpence?

3. 286,380 ÷ 148.

4. After spending 5s. 8½d., giving away 3s. 10½d. and losing 4½d., how much was left out of half-a-sovereign?

Card 9.

1. If a man can walk twenty-nine miles a day, how long would it take him to walk five thousand one hundred and four miles?

2. Three thousand and seven pounds fifteen shillings and sevenpence three-farthings — two thousand and ninety-eight pounds nineteen shillings and eightpence farthing.

3. £68 5s. 9¾d. + £493 19s. 11½d. + £7 8s. 5¼d. + £58,019 16s. 10¾d. + £7,940 10s. 8½d. + £70,638 15s. 8d.

4. 38 boys had 79 marbles each, and 27 boys had 56 each. How many short of five thousand had they?

Card 10.

1. Divide three-quarters of a million by 347.

2. Find the amount of £96 11s. 5¾d., seven thousand and eight pounds fourteen shillings and tenpence halfpenny, £5 18s. 7¾d., seventeen shillings and elevenpence, £104 15s. 8¼d., and £9 19s. 6½d.

3. Subtract sixty-nine thousand eight hundred and nine pounds seventeen shillings and sixpence three-farthings from seventy thousand five hundred and sixty pounds seventeen shillings and threepence halfpenny

4. Jack had 14s. 6d., and George had 3s. 9d. less than Jack. How much had they together?

ER,' a Monthly Magazine, Price 6d.; Post Free, 8d.; One Year, 7/6.

Card 11.

1. How many wagonettes, each holding 26, will be required for 495 boys and 493 girls?
2. From forty thousand and three pounds seven shillings and fourpence farthing subtract nine thousand five hundred and eighty-six pounds seventeen shillings and ninepence halfpenny.
3. What is the quotient of four hundred and four thousand and forty and five hundred and thirty-six?
4. Add £79 16s. 1½d., £30,020 18s. 9½d., 11¼d., £800 10s. 7d., £306,805 19s. 10¾d., £4,009 15s., and £50,500 12s. 9¼d.

Card 12.

1. The dividend is one million thirty-seven thousand and ninety, the quotient is six thousand nine hundred and sixty, and the remainder is fifty. What is the divisor?
2. £854 17s. 2¼d. + seven thousand and thirty-eight pounds eighteen shillings and sixpence three-farthings + £16 14s. 9d. + £18,605 3s. 10½d. + £52,384 16s. 7¼d. + six thousand four hundred and seventy pounds five shillings and three halfpence.
3. How many gross boxes of pens can be made out of 11,844 dozen?
4. What must be added to eight thousand pounds seven shillings and three farthings to make thirteen thousand pounds?

Card 13.

1. A boy had 2,509 nuts, and he divided them, as far as he could, equally among his 26 playmates. How many had he left for himself?
2. From seventy pounds and fivepence farthing take four shillings and tenpence halfpenny.
3. A man divided half-a-crown among three boys. The first boy got 10d., and the second boy got 3d. more than the first boy. How much did the third boy get?
4. What is the sum of £4,015 16s. 7¾d., £890 11s. 10½d., £9,608 14s. 11¾d., £39 18s. 6¼d., and £5,783 17s. 9¾d.?

Card 14.

1. What must be added to £827 13s. 6¼d. to give £3,084 7s. 5¾d.?
2. Divide a quarter of a million by 52.
3. A farmer bought 34 sheep for £66 6s. How many shillings did each sheep cost?
4. Find the amount of sixty-seven thousand and forty-five pounds seventeen shillings and ninepence, eight pounds eighteen shillings and threepence three-farthings, fifteen shillings and tenpence farthing, two hundred and four thousand and six pounds, twelve shillings and fivepence three-farthings, sixteen shillings and sixpence halfpenny, and eighty thousand five hundred and seventy pounds eleven shillings and sevenpence farthing.

Card 15.

1. Divide the product of 513 and 595 by 459.
2. £618 14s. 5¾d. + £270 18s. 10¼d. + £847 9s. 9¼d. + £562 12s. 2¾d. + £439 11s. 7¾d. + £185 13s. 6¼d. + £764 17s. 11¾d.
3. A gentleman had a sovereign. He gave a penny each to one hundred boys, and twopence each to thirty girls. How much had he left?
4. Subtract twopence farthing from two hundred pounds.

Card 16.

1. Find the sum of £4,365 18s. 6¾d., £490 15s. 7½d., £6,908 10s. 11¾d., £76 14s. 8½d., £809 19s. 9¾d., £5,837 16s. 10½d., and £542 11s. 1¾d.
2. How often is 354 contained in one million twelve thousand four hundred and forty?
3. Harry had £1 7s. 3d. and Fred had twice as much. What had they together?
4. Find the difference between seven thousand and four pounds and half-a-crown, and £809 11s. 8¾d.

Card 17.

1. What is the two hundred and ninety-second part of eight hundred and five thousand nine hundred and twenty?
2. A dealer sold a horse for 40 guineas, making a profit of £8 11s. 3d. What did the horse cost him?
3. How many small bags, each holding 935 nuts, can be filled from three large bags, each containing 475,915?
4. How much is three thousand eight hundred and seventy-five pounds eleven shillings and eightpence farthing greater than eight hundred and seventy-nine pounds fourteen shillings and ninepence halfpenny?

Card 18.

1. Add together seven thousand one hundred and forty-two pounds fourteen shillings and sixpence halfpenny, six hundred and seventy-five pounds twelve shillings and sevenpence three-farthings, fifty-seven pounds six shillings and ninepence farthing, two thousand and eighty-four pounds thirteen shillings and eightpence halfpenny, five hundred and ninety-six pounds eighteen shillings and tenpence farthing, three thousand seven hundred pounds nine shillings and elevenpence halfpenny, and two hundred and forty-three pounds fifteen shillings and fourpence three-farthings.
2. A tank containing six thousand gallons of water supplies 86 houses. If each house requires 59 gallons, how many gallons remain in the tank?
3. Take eight hundred and five pounds and fourpence three-farthings from two thousand pounds seventeen shillings and a halfpenny.
4. What is the remainder when half a million is divided by 567?

Card 19.

1. If I spent £9 13s. 6d. and £7 14s. 10d. out of £20, how much had I left?
2. Divide one million five hundred and thirty thousand six hundred and sixty by ninety-seven, and multiply the quotient by six hundred and nine.
3. £876 18s. 9½d. + £7,050 18s. 6¼d. + £69,408 14s. 11¾d. + £97 10s. 8¼d. + £28,549 11s. 10½d. + £5 15s. 3¾d. + £52 19s. 7½d.
4. A boy bought a shilling's worth of marbles at 2d. a score. If he lost an eighth part of them, how many had he left?

Card 20.

1. Divide the sum of 3,974 and 3,788 by their difference.
2. Subtract forty-nine thousand nine hundred and ninety-nine pounds eighteen shillings and tenpence three-farthings from fifty thousand pounds thirteen shillings and eightpence farthing.
3. John had half-a-guinea and Willie had twelve shillings. After John had spent 3s. 9d. and Willie had spent 5s. 6d., how much had John more than Willie?
4. Add £4,257 18s. 9½d., £806 15s. 11¾d., £39,069 13s. 7¼d., £6,408 19s. 6d., £75 14s. 10¾d. and £540 18s. 8¼d.

A SPECIMEN COPY WILL BE SENT POST FREE TO ANY TEACHER FOR **2s.**

Book 1. Elements and Large Hand.

2. Capitals and Easy Words, sums and table matter (Half Text).

FOR STANDARD II.

3. Connected sentences, and specimen sums worked for examination (Half Text).

4. More difficult sentences, and specimen sums (Half Text).

FOR STANDARD III.

5 & 6. Specimen pieces of Dictation, and sums in Addition, Subtraction of Money, and Long Division (Double Small).

FOR STANDARD IV.

7 & 8. More difficult selections in Writing, and specimen sums in Compound Rules and Weights and Measures (Small Hand).

FOR STANDARDS V., VI. & VII.

9 & 10. Specimen Exercises in Composition, and Exercises in Practice, Proportion, Bills of Parcels, and Fractions (Small Hand).

The Schoolmaster says:—'The series can be well recommended to the notice of our readers.'

The Teachers' Aid says:—'These books are well graded, forming one systematic whole. The figures and capitals are bold and good copies. The paper and get up are good.'

A Head Master writes:—'I am very pleased with your Examination Copy-Books. I have lately introduced them throughout the School; and in my opinion they are nearer perfection than any I have yet seen.'

Another Teacher writes:—'The Copy-Books are admirable, especially the Upper Standards.'

Specimen Pages sent Post Free on Application to the Publishers.

London: JOSEPH HUGHES & CO., PIL

☞ SPECIMEN, Post Free, **2s.**

2/6	**WOLLMAN'S TEACHERS' ARITHMETIC.**	2/6

With a view to put this New and Important Work within the reach of every

PUPIL TEACHER, SCHOLARSHIP & CERTIFICATE CANDIDATE,

Messrs. JOSEPH HUGHES & CO. have pleasure in announcing that they have fixed the published price at HALF-A-CROWN. It is now possible for a Youth entering the profession to

BUY FOR TWO SHILLINGS

An Arithmetic—the work of an accomplished Mathematician—which will serve him throughout his apprenticeship, and till he sits for his Certificate.

☞ *Wollman's Teachers' Arithmetic exactly meets in all respects the requirements of the New Circular of the Education Department (No. 297).*

IT ALSO CONTAINS:—

21 YEARS' SCHOLARSHIP QUESTIONS

(With FULL MODEL SOLUTIONS for the LAST 4 YEARS, including the '91 Examination)

AND

11 YEARS' CERTIFICATE QUESTIONS

(With FULL MODEL SOLUTIONS for the LAST 5 YEARS, including the '91 Examination)

∴ A SPECIMEN COPY WILL BE SENT POST FREE TO ANY TEACHER FOR **2s.**

Book 1. Elements and Large Hand.
2. Capitals and Easy Words, sums and table matter (Half Text).

Card 21.

1. A boy saved 70 pennies, 50 sixpences, and 30 shillings. How much more did he want to make £4?
2. The product of two numbers is 221,364 and one number is 516. What is the other number?
3. Put down nine thousand eight hundred and seventy-six pounds nineteen shillings and eightpence three-farthings *seven* times, and then add up.
4. By how much does eleven thousand three hundred and eighty pounds eighteen shillings and fivepence halfpenny exceed eight thousand and ninety-seven pounds fourteen shillings and ninepence three-farthings?

Card 22.

1. Divide three-quarters of a million by four times thirty-six.
2. £8,583 16s. 8¼d. + seven hundred and ninety pounds fifteen shillings and threepence halfpenny + eight pounds and tenpence three-farthings + £756 19s. 7¼d. + twelve thousand and five pounds seventeen shillings and three halfpence + £60 15s. 2¼d. + eight thousand and four pounds eighteen shillings and eightpence halfpenny + £19 10s. 5¼d. + £65,653 17s. 11¼d.
3. Two persons have together ten thousand pounds. If one has £6,509 13s. 10½d., how much more has he than the other?
4. If the divisor is 138, the quotient 9,566, and the remainder 94, what is the dividend?

Card 23.

1. How much is two thousand and eighty-five pounds sixteen shillings and tenpence farthing less than four thousand and one pounds fourteen shillings and eightpence halfpenny?
2. If the quotient is 748 and the dividend is 445,808, what is the divisor?
3. What is the sum of £6,470 18s. 9¾d., £809 11s. 11½d., £7,048 15s. 6½d., £58 17s. 8¾d., £8,976 14s. 7½d., £10 10s. 10d., and £4,034 12s. 5½d.?
4. Two horses drew 4,320 bricks each. One drew 90 bricks each journey and the other drew 80. How many more journeys did one take than the other?

Card 24.

1. How often is fifty-eight contained in three million three hundred and forty-eight thousand and fifty?
2. Put down £768 15s. 11¼d. *three* times, and £957 18s. 6¾d. *five* times, and add all together.
3. What is the difference between £57 9s. 0¼d. and twelve five-pound notes?
4. A passenger train travels 1,190 miles in 34 hours, and a luggage train travels 684 miles in 38 hours. How many miles an hour does one train travel more than the other?

Card 25.

1. What is the difference between thirteen thousand and seventeen pounds fifteen shillings and three halfpence and four thousand nine hundred and eight pounds seventeen shillings and eightpence three-farthings.
2. A boy had a bag of marbles, and he gave 18 boys 7 each, lost 39, and had 35 left. How many had he at first?
3. Add together 17 guineas, 17 sovereigns, 17 shillings, 17 sixpences, 17 pence, and 17 farthings.
4. If 26 inches of string are required for one parcel, how many parcels could be tied with 92,170 inches of string?

Card 26.

1. There are 5,280 feet in a mile. How many feet are there in 970 miles?
2. £893 15s. 4d. + £74 10s. 9¼d. + £4,065 17s. 6½d. + £8 19s. 11d. + £586 8s. 10½d. + £7,302 16s. 8¾d.
3. A ship carried 400 barrels of oil. In a storm 54 were thrown overboard, and the remainder were sold at £16 each. How much was received for them?
4. What must you add to eight hundred and four pounds sixteen shillings and fivepence three-farthings to make one thousand pounds one shilling and a penny farthing?

Card 27.

1. What is the least number that must be taken from a million so that the remainder may be exactly divisible by 468?
2. How much is eighteen thousand and sixty-four pounds five shillings and eightpence farthing less than twenty-six thousand three hundred and eighteen pounds three shillings and sevenpence three-farthings?
3. Find the amount of £58 14s. 7¼d., £167 18s. 9½d., £9 15s. 11¾d., £40 17s. 10½d., £6 12s. 8¼d., £504 16s. 6¼d., and £93 14s. 4½d.
4. How many must be taken from 38 score to leave 47 dozen?

Card 28.

1. A suit of clothes cost three guineas. The coat cost £1 14s. 9d. and the vest cost 10s. 6d.; what was the cost of the trousers?
2. Add together two hundred and three pounds eleven shillings and sevenpence three-farthings, forty-eight thousand and seventy-six pounds sixteen shillings and tenpence halfpenny, seven hundred thousand and ninety pounds and twopence, elevenpence three-farthings, eight thousand nine hundred and seventy-six pounds eighteen shillings and ninepence halfpenny, ninety-four pounds nineteen shillings and sixpence three-farthings, and eight pounds fifteen shillings and fourpence farthing.
3. If the divisor is 854 and the dividend is nine hundred and twenty thousand four hundred, what is the quotient?
4. Take 17s. 9¾d. from £17 9s. 3d.

Card 29.

1. Divide 627,504 by 816, and multiply the quotient by 670.
2. From ten thousand seven hundred and three pounds fourteen shillings and threepence halfpenny subtract three thousand and eighty pounds fourteen shillings and sevenpence three-farthings.
3. How many small parcels, each weighing 39 lbs., can be made from two large ones, weighing 12,869 lbs. and 10,458 lbs.?
4. Find the total amount of £1,024 16s. 8½d., £673 19s. 10¾d., £6,409 17s. 11¼d., £785 12s. 9½d., £8,540 18s. 7d., and £268 15s. 5¾d.

Card 30.

1. How much less is six hundred and ninety-four pounds eighteen shillings and ninepence halfpenny than seven hundred and four pounds fifteen shillings and threepence three-farthings?
2. The quotient in a division sum is 7,598, the divisor 758, and the remainder is half the divisor. What is the dividend?
3. £48,927 11s. 8½d. + £9,506 16s. 10¾d. + £890 18s. 2½d. + £5,002 10s. 9¼d. + £489 14s. 5¾d + £98 19s. 3½d. + £6,975 13s. 6½d. + £10,764 15s. 4½d.
4. If ten thousand nuts were divided among 180 boys and 150 girls, and each girl got 32, how many did each boy get?

A Prize of **HALF-A-GUINEA** will be paid to the Teacher who

Card 31.

1. Divide one million five hundred thousand and forty by 849.
2. £12 19s. 8¼d. + seven hundred and six pounds fifteen shillings and tenpence halfpenny + £7,890 18s. 7¼d. + eight thousand and eighty-seven pounds fourteen shillings and ninepence three-farthings + £60,308 16s. 5½d. + seven hundred and nineteen pounds thirteen shillings and elevenpence three-farthings.
3. How many books of 357 leaves each can be made from 609 packets of paper, each containing 782 leaves?
4. By how much does 395 pounds exceed 395 shillings?

Card 32.

1. What is the sum of £380 11s. 7¼d., £6,804 14s. 6½d., £27 18s. 5¾d., £10,613 17s. 10¼d., and twelve and a half guineas?
2. A horse, cow, and two sheep cost £70. The horse cost £46 10s., and the cow cost £17 10s. What was the cost of each sheep?
3. How many times can 69 be subtracted from 187,542?
4. Take 11¾d. from ten thousand pounds.

Card 33.

1. How many years are there in one million nineteen thousand nine hundred and twenty-eight weeks, reckoning 52 weeks in a year?
2. How much greater is seventy thousand four hundred and three pounds eleven shillings and fivepence halfpenny than sixty thousand five hundred and eight pounds twelve shillings and sixpence farthing?
3. At an election 4,926 voted for one candidate, and the other was elected by 578. How many voted altogether?
4. Add together 34 pounds, 34 shillings, 34 pence, and 34 farthings.

Card 34.

1. Subtract £19,088 17s. 3d. from £20,017 15s. 0¾d.
2. Seven hundred and ninety-seven thousand three hundred ÷ thirty-four.
3. Put £7,569 18s. 11¾d. down *eight* times, and then add.
4. A gentleman had thirty-five pounds, and gave away two shillings out of every sovereign. How much had he left?

ANSWERS.

Card 1.
1. 18,945 times.
2. £200 3s. 8½d.
3. £999 3s. 5¾d.
4. £2 17s. 11d.

Card 2.
1. £8,993 8s. 5¾d.
2. 1,964.
3. £59,997 1s. 5¾d.
4. 258 pages.

Card 3.
1. £6,127 15s. 9½d.
2. £107,893 4s. 4½d.
3. 87 marbles.
4. 19,232 + 111.

Card 4.
1. £1,793 12s. 6d.
2. £34,772 13s. 1½d.
3. 3,120.
4. £290,972 10s. 10¾d.

Card 5.
1. 952 times.
2. £10,724 8s. 11½d.
3. £42 10s.
4. £14,010 10s. 2d.

Card 6.
1. £723,675 19s. 9½d.
2. 1,479.
3. £91,781 9s. 7½d.
4. 10,362 + 22.

Card 7.
1. 7,481.
2. £512 9s.
3. 590.
4. £1,113 12s. 5¾d.

Card 8.
1. £15,220 1s. 5½d.
2. £412,981 19s. 7d.
3. 1,935.
4. ¼d.

Card 9.
1. 176 days.
2. £908 15s. 11½d.
3. £137,168 17s. 5¾d.
4. 486 marbles.

Card 10.
1. 2,161 + 133.
2. £7,226 18s. 1¾d.
3. £750 19s. 8¾d.
4. £1 5s. 3d.

Card 11.
1. 38 wagonettes.
2. £30,416 9s. 6¾d.
3. 753 + 432.
4. £392,217 14s. 1d.

Card 12.
1. 149.
2. £85,370 16s. 1½d.
3. 987 boxes.
4. £4,999 12s. 11¼d.

Card 13.
1. 13 nuts.
2. £69 15s. 6¾d.
3. 7d.
4. £20,338 19s. 10d.

Card 14.
1. £2,256 13s. 11¼d.
2. 4,807 + 36.
3. 39 shillings.
4. £351,633 12s. 6½d.

Card 15.
1. 665.
2. £3,189 18s. 6½d.
3. 6s. 8d.
4. £199 19s. 9¾d.

Card 16.
1. £19,032 7s. 8½d.
2. 2,860 times.
3. £4 1s. 9d.
4. £6,194 10s. 9½d.

Card 17.
1. 2,760.
2. £33 8s. 9d.
3. 1,527 bags.
4. £2,995 16s. 10½d.

Card 18.
1. £14,501 11s. 10½d.
2. 926 gallons.
3. £1,195 16s. 7¾d.
4. 473.

Card 19.
1. £2 11s. 8d.
2. 9,610,020.
3. £106,042 4s. 9½d.
4. 105 marbles.

Card 20.
1. 41 + 136.
2. 14s. 9½d.
3. 3d.
4. £51,160 1s. 5½d.

Card 21.
1. 19s. 2d.
2. 429.
3. £69,138 18s. 1¼d.
4. £3,283 3s. 7¾d.

Card 22.
1. 5,208 + 48.
2. £95,884 11s. 10¾d.
3. £3,019 7s. 9d.
4. 1,320,202.

Card 23.
1. £1,915 17s. 10¼d.
2. 596.
3. £27,410 1s. 11¼d.
4. 6 journeys.

Card 24.
1. 57,725 times.
2. £7,096 0s. 7½d.
3. £2 10s. 11¾d.
4. 17 miles.

Card 25.
1. £8,108 17s. 4¾d.
2. 200 marbles.
3. £36 4s. 3½d.
4. 3,545 parcels.

Card 26.
1. 5,121,600 feet.
2. £12,932 9s. 2d.
3. £5,536.
4. £195 4s. 7½d.

Card 27.
1. 352.
2. £8,253 17s. 11½d.
3. £882 10s. 10½d.
4. 196.

Card 28.
1. 17s. 9d.
2. £757,451 3s. 4½d.
3. 2,600.
4. £16 11s. 5½d.

Card 29.
1. 515,230.
2. £7,622 19s. 7¾d.
3. 598 parcels.
4. £17,704 1s. 4¾d.

Card 30.
1. £9 16s. 6¼d.
2. 5,759,663.
3. £82,657 0s. 3½d.
4. 40 nuts.

Card 31.
1. 4,298 + 38.
2. £77,726 19s. 5d.
3. 1,334 books.
4. £375 5s.

Card 32.
1. £17,840 4s. 11¾d.
2. £3.
3. 2,718 times.
4. £9,999 19s. 0¼d.

Card 33.
1. 19,614 years.
2. £9,894 18s. 11¼d.
3. 10,430.
4. £35 17s. 6¼d.

Card 34.
1. £978 17s. 9¾d.
2. 23,450.
3. £60,559 11s. 10d.
4. £31 10s.

N.B.—No teacher can win more than one prize in six months.

eacher who is the FIRST to point out an Error in the above Answers.

WOLLMAN'S

DAILY-WORKING & TEST ARITHMETICS

(INCLUDING MENTAL ARITHMETIC), in Seven Books for the Seven Standards.

THE MOST PRACTICAL TIME-SAVING AND COMPREHENSIVE ARITHMETIC EVER ISSUED.

STANDARD I. .... PRICE 2d.

STANDARD II.	....	PRICE 2d.	STANDARD V.	....	PRICE 3d.
STANDARD III.	....	„ 3d.	STANDARD VI.	....	„ 3d.
STANDARD IV.	....	„ 3d.	STANDARD VII.	....	„ 3d.

CORRECT ANSWER BOOKS, PRICE 3D. EACH STANDARD.

SPECIAL FEATURES.

1. Work for each standard is arranged for three quarters.
2. After each quarter there is a set of Twenty-six Test Examinations (four questions in each set).
3. The Tests after the third quarter comprise the whole of the standard work.
4. There are Seventy-eight Arithmetic Tests of four questions each in each book, in addition to the questions and problems under each rule.
5. After each quarter there are sets of Mental Arithmetic Tests.
6. The Mental Tests are preparatory to the next quarter's work and to the work of the next standard.
7. The Arithmetic and Mental Tests are based on H.M. Inspectors' questions.
8. The books include ALL the arithmetic work, and render Test Cards unnecessary.

FIFTH EDITION. Price 1d.

WOLLMAN'S METRIC-SYSTEM MADE EASY,

WITH NUMEROUS EXAMPLES.

The Teachers' Aid says:—'This is a practical little Handbook showing the immense saving of time and trouble in working arithmetical problems which would accrue from the adoption of the decimal system.'

GRIM STREET, LUDGATE HILL, E.C. L